



**CASE FILE
COPY**

**AEROSPACE MEDICINE
AND BIOLOGY**

A CONTINUING BIBLIOGRAPHY

WITH INDEXES

(Supplement 160)

NOVEMBER 1976

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

ACCESSION NUMBER RANGES

Accession numbers cited in this Supplement fall within the following ranges:

STAR (N-10000 Series) N76-28154—N76-30146

IAA (A-10000 Series) A76-38273—A76-41506

This bibliography was prepared by the NASA Scientific and Technical Information Facility operated for the National Aeronautics and Space Administration by Informatics Information Systems Company.

AEROSPACE MEDICINE AND BIOLOGY

A CONTINUING BIBLIOGRAPHY WITH INDEXES

(Supplement 160)

A selection of annotated references to unclassified reports and journal articles that were introduced into the NASA scientific and technical information system and announced in October 1976 in

- *Scientific and Technical Aerospace Reports (STAR)*
- *International Aerospace Abstracts (IAA).*



Scientific and Technical Information Office

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Washington, D.C.

NOVEMBER 1976

NASA SP-7011 and its supplements are available from the National Technical Information Service (NTIS). Questions on the availability of the predecessor publications, Aerospace Medicine and Biology (Volumes I - XI) should be directed to NTIS.

This Supplement is available from the National Technical Information Service (NTIS), Springfield, Virginia 22161, for \$4.00. For copies mailed to addresses outside the United States, add \$2.50 per copy for handling and postage.

INTRODUCTION

This Supplement to *Aerospace Medicine and Biology* (NASA SP-7011) lists 166 reports, articles and other documents announced during October 1976 in *Scientific and Technical Aerospace Reports (STAR)* or in *International Aerospace Abstracts (IAA)*. The first issue of the bibliography was published in July 1964; since that time, monthly supplements have been issued.

In its subject coverage, *Aerospace Medicine and Biology* concentrates on the biological, physiological, psychological, and environmental effects to which man is subjected during and following simulated or actual flight in the earth's atmosphere or in interplanetary space. References describing similar effects of biological organisms of lower order are also included. Such related topics as sanitary problems, pharmacology, toxicology, safety and survival, life support systems, exobiology, and personnel factors receive appropriate attention. In general, emphasis is placed on applied research, but references to fundamental studies and theoretical principles related to experimental development also qualify for inclusion.

Each entry in the bibliography consists of a bibliographic citation accompanied in most cases by an abstract. The listing of the entries is arranged in two major sections: *IAA Entries* and *STAR Entries*, in that order. The citations, and abstracts when available, are reproduced exactly as they appeared originally in *IAA* or *STAR*, including the original accession numbers from the respective announcement journals. This procedure, which saves time and money, accounts for the slight variation in citation appearances.

Two indexes—subject and personal author—are included.

An annual index will be prepared at the end of the calendar year covering all documents listed in the 1976 Supplements.

AVAILABILITY OF CITED PUBLICATIONS

IAA ENTRIES (A76-10000 Series)

All publications abstracted in this Section are available from the Technical Information Service, American Institute of Aeronautics and Astronautics, Inc. (AIAA), as follows: Paper copies are available at \$5.00 per document up to a maximum of 20 pages. The charge for each additional page is 25 cents. Microfiche⁽¹⁾ are available at the rate of \$1.50 per microfiche for documents identified by the # symbol following the accession number. A number of publications, because of their special characteristics, are available only for reference in the AIAA Technical Information Service Library. Minimum airmail postage to foreign countries is \$1.00. Please refer to the accession number, e.g., (A76-13400), when requesting publications.

STAR ENTRIES (N76-10000 Series)

One or more sources from which a document announced in *STAR* is available to the public is ordinarily given on the last line of the citation. The most commonly indicated sources and their acronyms or abbreviations are listed below. If the publication is available from a source other than those listed, the publisher and his address will be displayed on the availability line or in combination with the corporate source line.

Avail: NTIS. Sold by the National Technical Information Service to U.S. customers at the price shown in the citation following the letters HC (hard, paper, or facsimile copy). Customers outside the U.S. should add \$2.50 per copy for handling and postage charges to the price shown. (Prices shown in earlier *STAR* volumes, 1962-1975, have been superseded but may be calculated from the number of pages shown in the citation. The price schedule by page count was published in *STAR* Numbers 2 and 3 of 1976, or it may be obtained from NTIS.)

Microfiche⁽¹⁾ is available at a standard price of \$3.00 (plus \$1.50 for non-U.S. customers) regardless of source or the quality of the fiche, for those accessions followed by a # symbol. Accession numbers followed by a + sign are not available as microfiche because of size or reproducibility.

Initially distributed microfiche under the NTIS SRIM (Selected Research in Microfiche) is available at greatly reduced unit prices. For this service and for information concerning subscription to NASA printed reports, consult the NTIS Subscription Unit.

NOTE ON ORDERING DOCUMENTS: When ordering NASA publications (those followed by the * symbol), use the N accession number. NASA patent applications (only the specifications are offered) should be ordered by the US-Patent-Appl-SN number. Non-NASA publications (no asterisk) should be ordered by the AD, PB, or other *report* number shown on the last line of the citation, not by the N accession number. It is also advisable to cite the title and other bibliographic identification.

Avail: SOD (or GPO). Sold by the Superintendent of Documents, U.S. Government Printing Office, in hard copy. The current price and order number are given following the availability line. (NTIS will fill microfiche requests, at the standard \$3.00 price, for those documents identified by a # symbol.)

(1) A microfiche is a transparent sheet of film, 105 by 148 mm in size, containing as many as 60 to 98 pages of information reduced to micro images (not to exceed 26:1 reduction).

- Avail: NASA Public Document Rooms. Documents so indicated may be examined at or purchased from the National Aeronautics and Space Administration, Public Documents Room (Room 126), 600 Independence Ave., S.W., Washington, D.C. 20546, or public document rooms located at each of the NASA research centers, the NASA Space Technology Laboratories, and the NASA Pasadena Office at the Jet Propulsion Laboratory.
- Avail: ERDA Depository Libraries. Organizations in U.S. cities and abroad that maintain collections of Energy Research and Development Administration reports, usually in microfiche form, are listed in *Nuclear Science Abstracts*. Services available from the ERDA and its depositories are described in a booklet, *Science Information Available from the Energy Research and Development Administration* (TID-4550), which may be obtained without charge from the ERDA Technical Information Center.
- Avail: Univ. Microfilms. Documents so indicated are dissertations selected from *Dissertation Abstracts* and are sold by University Microfilms as xerographic copy (HC) and microfilm. All requests should cite the author and the Order Number as they appear in the citation.
- Avail: USGS. Originals of many reports from the U.S. Geological Survey, which may contain color illustrations, or otherwise may not have the quality of illustrations preserved in the microfiche or facsimile reproduction, may be examined by the public at the libraries of the USGS field offices whose addresses are listed in this Introduction. The libraries may be queried concerning the availability of specific documents and the possible utilization of local copying services, such as color reproduction.
- Avail: HMSO. Publications of Her Majesty's Stationery Office are sold in the U.S. by Pendragon House, Inc. (PHI), Redwood City, California. The U.S. price (including a service and mailing charge) is given, or a conversion table may be obtained from PHI.
- Avail: BLL (formerly NLL): British Library Lending Division, Boston Spa, Wetherby, Yorkshire, England. Photocopies available from this organization at the price shown. (If none is given, inquiry should be addressed to the BLL.)
- Avail: ZLDI. Sold by the Zentralstelle für Luftfahrtokumentation und -Information, Munich, Federal Republic of Germany, at the price shown in deutschmarks (DM).
- Avail: Issuing Activity, or Corporate Author, or no indication of availability. Inquiries as to the availability of these documents should be addressed to the organization shown in the citation as the corporate author of the document.
- Avail: U.S. Patent Office. Sold by Commissioner of Patents, U.S. Patent Office, at the standard price of 50 cents each, postage free.
- Other availabilities: If the publication is available from a source other than the above, the publisher and his address will be displayed entirely on the availability line or in combination with the corporate author line.

SUBSCRIPTION AVAILABILITY

This publication is available on subscription from the National Technical Information Service (NTIS). The annual subscription rate for the monthly supplements, excluding the annual cumulative index, is \$18.75 domestic; \$23.50 foreign. All questions relating to the subscriptions should be referred to NTIS.

ADDRESSES OF ORGANIZATIONS

American Institute of Aeronautics
and Astronautics
Technical Information Service
750 Third Ave.
New York, N.Y. 10017

British Library Lending Division,
Boston Spa, Wetherby, Yorkshire,
England

Commissioner of Patents
U.S. Patent Office
Washington, D.C. 20231

Energy Research and Development
Administration
Technical Information Center
P.O. Box 62
Oak Ridge, Tennessee 37830

ESA-Space Documentation Service
ESRIN
Via Galileo Galilei
00044 Frascati (Rome) Italy

Her Majesty's Stationery Office
P.O. Box 569, S.E. 1
London, England

NASA Scientific and Technical Information
Facility
P.O. Box 8757
B. W. I. Airport, Maryland 21240

National Aeronautics and Space
Administration
Scientific and Technical Information
Office (KSI)
Washington, D.C. 20546

National Technical Information Service
Springfield, Virginia 22161

Pendragon House, Inc.
899 Broadway Avenue
Redwood City, California 94063

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

University Microfilms
A Xerox Company
300 North Zeeb Road
Ann Arbor, Michigan 48106

University Microfilms, Ltd.
Tylers Green
London, England

U.S. Geological Survey
1033 General Services Administration Bldg.
Washington, D.C. 20242

U.S. Geological Survey
601 E. Cedar Avenue
Flagstaff, Arizona 86002

U.S. Geological Survey
345 Middlefield Road
Menlo Park, California 94025

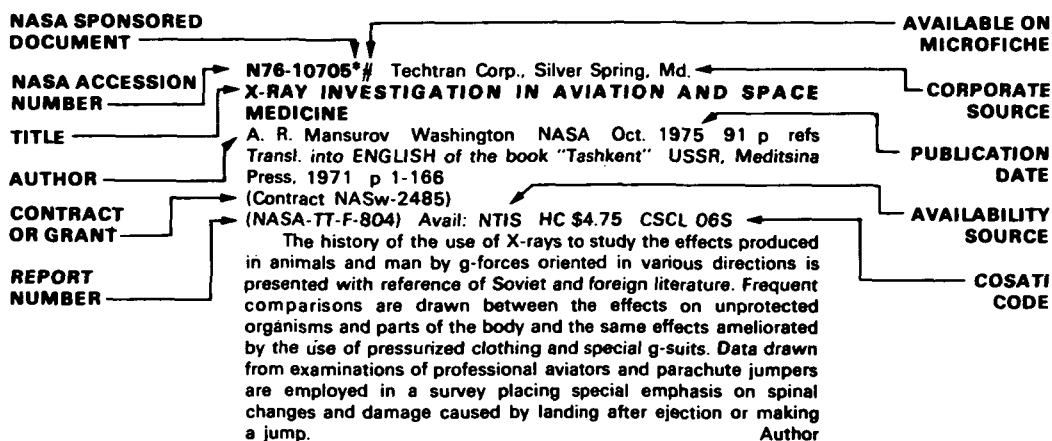
U.S. Geological Survey
Bldg. 25, Denver Federal Center
Denver, Colorado 80225

Zentralstelle für Luftfahrt-doku-
mentation und -Information
8 München 86
Postfach 880
Federal Republic of Germany

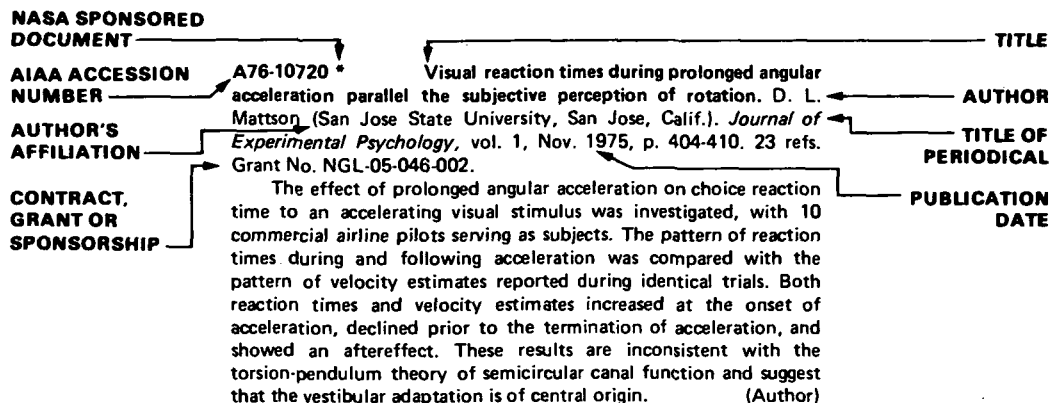
TABLE OF CONTENTS

	Page
IAA Entries (A76-10000).....	265
STAR Entries (N76-10000).....	281
Subject Index.....	I-1
Personal Author Index.....	I-19

TYPICAL CITATION AND ABSTRACT FROM STAR



TYPICAL CITATION AND ABSTRACT FROM /AA



AEROSPACE MEDICINE AND BIOLOGY

A Continuing Bibliography (Suppl. 160)

NOVEMBER 1976

IAA ENTRIES

A76-38316 Solar energy utilization in photosynthesis. G. Forti (Milano, Università, Milan, Italy). In: Energy and physics; Proceedings of the Third General Conference, Bucharest, Rumania, September 9-12, 1975. Geneva, European Physical Society, 1976, p. 375-378.

The process of photosynthesis in plants is described in detail with particular attention paid to energy balance. The possible development of a solar energy conversion technology using photosynthesis is discussed with reference to the following three areas: (1) hydrogen production in certain microalgae, (2) the use of photosynthesis in constructing photovoltaic cells, and (3) the use of photosynthetic microorganisms for the treatment of sewage water and other wastes for the purposes of water purification and biomass production. B.J.

A76-38343 Course on High Energy Radiation Dosimetry and Protection, 1st, International School of Radiation Damage and Protection, Erice, Italy, October 1-10, 1975, Proceedings. Course sponsored by the Italian Ministry of Public Education, Italian Ministry of Scientific and Technological Research, and Associazione Italiana di Fisica Sanitaria e Protezione Contro le Radiazioni. *IEEE Transactions on Nuclear Science*, vol. NS-23, Aug. 1976. 127 p.

Articles dealing with the radiation environment of accelerator facilities and of spacecraft, radiation detection and dosimetry, personnel dosimetry, induced radioactivity and accelerator environments, applications of computers in health physics, evaluation of health risk and microdosimetry, and future radiation safety trends at fission and fusion reactors and accelerator facilities are presented. Particular papers deal in addition with personnel dosimetry during space missions, biological effects of small doses of radiation and of high-energy radiation, applications of high-energy physics techniques in medical research, radiation environment of storage rings, and shielding. R.D.V.

A76-38346 * Dosimetry during space missions. J. V. Bailey (NASA, Johnson Space Center, Environmental Health Branch, Houston, Tex.). (Course on High Energy Radiation Dosimetry and Protection, 1st, Erice, Italy, Oct. 1-10, 1975.) *IEEE Transactions on Nuclear Science*, vol. NS-23, Aug. 1976, p. 1379-1384.

Comparative radiation hazards due to various sources of radiation in several prominent manned space missions are surveyed, along with techniques for coping with the hazards. Cosmic radiation of solar and galactic origin, and Van Allen belt radiation, are the major hazards outside the earth's geomagnetic shield, and were a major problem in the Apollo missions. The Skylab missions, while within the geomagnetic field, were subject to extensive exposure to the trapped radiation belts (Van Allen belts), while the Soyuz-Apollo test project involved orbiting at a lower altitude, with lower exposure. No solar particle bursts affected Apollo missions, and the Solar Particle Alert Network devised to help cope with the problem is described. Dosimetry practices and devices are described. Radia-

tion experience and dose readings logged with the various missions are reported. R.D.V.

A76-38347 The biological effects of high-energy radiation. S. B. Curtis (California, University, Berkeley, Calif.). (Course on High Energy Radiation Dosimetry and Protection, 1st, Erice, Italy, Oct. 1-10, 1975.) *IEEE Transactions on Nuclear Science*, vol. NS-23, Aug. 1976, p. 1414-1416. 15 refs.

The biological effects of high-energy radiation are reviewed, with emphasis on the effects of the hadronic component. Proton and helium ion effects are similar to those of the more conventional and sparsely ionizing X- and gamma-radiation. Heavy ions are known to be more biologically effective, but the long term hazard from accumulated damage has yet to be assessed. Some evidence of widely varying but dramatically increased effectiveness of very high-energy (about 70 GeV) hadron beams is reviewed. Finally, the importance of the neutron component in many situations around high-energy accelerators is pointed out. (Author)

A76-38348 Microdosimetry and the effects of small doses of radiation. H. H. Rossi (Columbia University, New York, N.Y.). (Course on High Energy Radiation Dosimetry and Protection, 1st, Erice, Italy, Oct. 1-10, 1975.) *IEEE Transactions on Nuclear Science*, vol. NS-23, Aug. 1976, p. 1417-1421. Contract No. E(11-1)-3243; Grant No. NIH-CA-12536.

Energy distribution on a cellular or subcellular scale, and statistical treatment of events of random injury to individual cells by radiation, are stressed as central to microdosimetry. Different statistical patterns for different modes of radiation and different tissues are considered. Biological effects of radiation are known to depend on the species of bombarding particle and not solely on absorbed dose. Effects of radiation-induced lesions and possible synergistic effects of interacting pairs of sublesions, possible interactions between radiation-affected cells in carcinogenesis and the probable lack of such interaction in radiation-affected gametes are discussed. R.D.V.

A76-38440 Combining evidence presented simultaneously to the eye and the ear - A comparison of some predictive models. A. Craig, W. P. Colquhoun (Medical Research Council, Perceptual and Cognitive Performance Unit, Brighton, Sussex, England), and D. W. J. Corcoran (Glasgow, University, Glasgow, Scotland). *Perception and Psychophysics*, vol. 19, no. 6, June 1976, p. 473-484. 4 refs. Research supported by the Ministry of Defence (Procurement Executive).

Data from a sustained monitoring experiment involving auditory, visual and combined audio-visual signal recognition were used to assess the predictive validity of five models of bisensory information processing. Satisfactory predictions of the dual-mode performance levels were made only by two models, neither of which assumes that the auditory and visual systems operate independently, and correlations which attest to this nonindependence are presented. One of these models explicitly assumes that the two systems are associated so that their judgments tend to coincide; the other assumes that the visual system 'alerts' the auditory system to the presence of a signal. Both models accurately predict the levels of efficiency and dual-mode criterion in the dual-mode condition, and the 'alerting' one also accounts for the observed reduction in response latencies. (Author)

A76-38441 Motion constancy dependent upon perceived distance and the spatial frequency of the stimulus pattern. E. R. Wist, H. C. Diener, and J. Dichgans (Neurologische Universitätsklinik, Freiburg im Breisgau, West Germany). *Perception and Psychophysics*, vol. 19, no. 6, June 1976, p. 485-491. 16 refs. Deutsche Forschungsgemeinschaft Contract No. SFB-70.

The relationship between perceived distance and perceived speed for object-motion perception was determined using a magnitude-estimation technique. It was found that perceived speed increases linearly with perceived distance when angular speed is held constant. Furthermore, it was found that the spatial frequency of a moving periodic stripe pattern potentiates the effect of perceived distance on perceived speed. The slope of the function relating perceived speed and perceived distance was found to increase linearly with increasing spatial frequency. The functional significance of these findings for motion constancy is discussed. (Author)

A76-38442 The constancy of the orientation of the visual field. H. Wallach and J. Bacon (Swarthmore College, Swarthmore, Pa.). *Perception and Psychophysics*, vol. 19, no. 6, June 1976, p. 492-498. 5 refs. Grant No. NIH-11089.

Evidence is presented that the perceived immobility of the environment during tilting of the head from side to side results from a compensating process. This compensating process operates well only when peripheral vision is present. An objectively stationary environment was, for instance, not perceived as immobile during head tilting when vision was confined to the macular region of the retina. The compensating process could be rapidly altered by exposure to environmental tilting during and dependent on head tilting. Such adaptation had the result that some environmental tilting that normally is perceived led to apparent immobility. (Author)

A76-38443 Induced subject-relative movement - Persistence of apparent movement of a stationary point after removal of inducing stimulus. R. H. Day, R. G. Dickinson, and K. I. Forster (Monash University, Clayton, Victoria, Australia). *Perception and Psychophysics*, vol. 19, no. 6, June 1976, p. 510-517. 10 refs. Australian Research Grants Committee Grant No. A65/15940.

The apparent movement of a stationary point of light in an otherwise dark field in the same direction as its immediately preceding induced movement (IM) is described. The effect is referred to as induced subject-relative movement (ISRM) and is confirmed and further investigated in four experiments. The purpose of the first experiment was to confirm earlier observations and verbal reports of ISRM and to record it by means of manual tracking. The second experiment was essentially the same as the first, except that after a period of IM of the spot the movement of the frame was merely stopped. In the third experiment, the spot was tracked for 5 sec both before and after IM with the moving frame. The fourth experiment was to establish whether ISRM follows real movement of the spot in a stationary frame. The results suggest that ISRM arises from the absence of a signal for cessation of perceived movement when the frame disappears. ISRM also occurred following nonlinear IM. S.D.

A76-38444 The influence of selective attention in peripheral and foveal vision. B. A. Ambler and D. L. Finklea (Texas University, Arlington, Tex.). *Perception and Psychophysics*, vol. 19, no. 6, June 1976, p. 518-524. 11 refs. Research supported by the University of Texas.

Four series of experiments were conducted to investigate the role of attention processes in the discrimination of line slant and line arrangement differences in foveal and peripheral vision. The stimulus letters were upright T, and L and T tilted 30 deg clockwise from the vertical. Major findings are that distributed attention does not degrade foveal line arrangement discrimination if the attention system is overloaded by increasing the number of elements in the array, that line arrangement discrimination is reduced as letter number increases even when maximum density is held constant, and that concentrated attention facilitates line arrangement discrimination relative to line slant discrimination in foveal vision when

element number and density are held constant. The data support the existence of two functionally different attention systems, the distributed system being much more sensitive to line slant differences than to line arrangement differences under conditions of high figure density. S.D.

A76-38619 Biological evaluation of the toxicity of gases produced under fire conditions by synthetic materials. I - Methods and preliminary experiments concerning the reaction of animals to simple mixtures of air and carbondioxide or carbonmonoxide. C. Herpol, R. Minne, and E. van Outryve (Gent, Rijksuniversiteit, Ghent, Belgium). *Combustion Science and Technology*, vol. 12, no. 4-6, 1976, p. 217-228. 12 refs. Research supported by the Institut pour l'Encouragement de la Recherche Scientifique dans l'Industrie et l'Agriculture and Fédération des Industries Chimiques de Belgique.

A76-38701 # A study on examination procedures for preventing traumatic and nontraumatic osteoarthropathies related to flying activities (Studio sulle metodiche di esami per la prevenzione delle osteoartropatie traumatiche e non traumatiche legate all'attività di volo). G. Rotondo. (NATO, AGARD, Aerospace Medical Panel Specialists Meeting, 32nd, Ankara, Turkey, Oct. 21-24, 1975.) *Rivista di Medicina Aeronautica e Spaziale*, vol. 38, Oct.-Dec. 1975, p. 375-391. 25 refs. In Italian.

X-ray checkup programs are recommended particularly for flying personnel engaging in aerobatics or who have experienced catapulted seat ejection. Injury statistics are cited for catapulted ejection subjects. Incidences of traumatic spinal injuries (fractures, inflections, lumbar kyphosis, lordosis, scoliosis, slipped disks) incompatible with normal flying activities were cited. Attention is also given to recurrent nontraumatic spinal lesions (undiagnosed inflections; osteoarthrotic conditions such as: spondyloarthrosis, rheumatoid arthritis, arthromuscular rheumatism, osteomyelitis, bursitis, arthrosynovitis, tenosynitis; minor discopathies). Timely detection and diagnosis of such lesions is stressed as important in prophylaxis and therapy. R.D.V.

A76-38702 # Behavior of some respiratory parameters in student pilots - A comparative study on two distinct groups examined ten years apart (Comportamento di alcune grandezze respiratorie negli aspiranti piloti - Studio comparativo fra due gruppi diversi esaminati a dieci anni di distanza). C. A. Ramacci (Aeronautica Militare, Centro di Studi e Ricerche di Medicina Aeronautica e Spaziale, Rome, Italy) and G. Meineri. (NATO, AGARD, Aerospace Medical Panel Specialists Meeting, 32nd, Ankara, Turkey, Oct. 21-24, 1975.) *Rivista di Medicina Aeronautica e Spaziale*, vol. 38, Oct.-Dec. 1975, p. 392-402. In Italian.

A test is made of the hypothesis that some accepted static respiratory parameters might undergo changes with time due to physical anthropological (normal somatological) variations in the human sample population. Vital capacity, timed vital capacity (volume forcibly expired in first second), and the ratio of the two (Tiffeneau index) are studied for groups of pilot candidates, examined medically in 1961-62 and in 1971-72. A 2 cm increase in height is reported for the latter group, but without significant differences in the other parameters. Caution backed up by periodic checks is recommended, however, and a report of a 30% normal anthropological increase in vital capacity in subjects studied over 1953-1966 is cited. R.D.V.

A76-38703 # Making use of the laboratory in aerospace medicine (Utilizzazione del laboratorio in medicina aerospaziale). G. Paolucci (Aeronautica Militare, Servizio Sanitario, Rome, Italy). (NATO, AGARD, Aerospace Medical Panel Specialists Meeting, 32nd, Ankara, Turkey, Oct. 21-24, 1975.) *Rivista di Medicina Aeronautica e Spaziale*, vol. 38, Oct.-Dec. 1975, p. 403-410. 12 refs. In Italian.

Some laboratory services are recommended as indispensable aids in diagnostic-prognostic and forensic work: ascertaining individual endogenous biomedical responses and eventual pathological states;

objective evaluation of emotional states in flight and in accident victims at time of death (through biochemical analysis); experimental and clinical traumatology; identification of accident victims and portions of cadavers severed and scattered over an area; tests determining whether an accident victim was alive at the time of impact or submersion. Toxicological, histological, histochemical (serotonin, histamine, hyaluronidase, carboxyhemoglobin) tests, erythrocyte sedimentation, thromboelastography, enzyme determinations, and urinary catecholamine analysis are mentioned. R.D.V.

A76-38704 # Operational stress and higher psychic functions - Observations on flight crews and parachutists in various phases of a parachute jump mission (Stress operativo e funzioni psichiche superiori - Osservazioni su equipaggi di volo e paracadutisti nelle varie fasi di un aviolancio militare). L. Longo. (NATO, AGARD, Aerospace Medical Panel Specialists Meeting, 32nd, Ankara, Turkey, Oct. 21-24, 1975.) *Rivista di Medicina Aeronautica e Spaziale*, vol. 38, Oct.-Dec. 1975, p. 411-426. 31 refs. In Italian.

The jump mission is divided into three phases: pre-jump (mission briefing and preparation, harnessing, checkout, emplane-ment and takeoff, connecting to rip cord, moving to jump door), jump (exit, chute opening shock, deployment of canopy), and post-jump (descent maneuvers, impact on ground, release from harness and mission action). Interview and interrogatory procedures are outlined; sensory-perceptive response mechanisms are reviewed. Emotive and affective states in all phases and subphases are considered, including psychological identification of rip cord and umbilical cord, waiting anxieties, attention, evaluation, decision making, and stress levels. R.D.V.

A76-38705 # Verification of hemostasis disorders in air force personnel (Accertamento di difetti dell'emostasi in personale aeronautico). G. Blundo, G. Paolucci (Aeronautica Militare, Servizio Sanitario, Rome, Italy), and P. Rota. (NATO, AGARD, Aerospace Medical Panel Specialists Meeting, 32nd, Ankara, Turkey, Oct. 21-24, 1975.) *Rivista di Medicina Aeronautica e Spaziale*, vol. 38, Oct.-Dec. 1975, p. 427-432. In Italian.

Results of a survey conducted on air force enlistees to ascertain the presence or likelihood of hemostasis disorders are reported. Case histories included reviews of family history for cases of easy hemorrhaging, reviews of personal history for prolonged contact with solvents, lubricants, paints and varnishes, other toxic substances (drugs, poisons) impairing blood clotting action, or diseases contributing to that effect. The efficiency of hemostatic processes in each subject was investigated via determination of Quick's time, partial thromboplastin time, thromboelastographic traces, and platelets counts. Less than 3% of the subjects exhibited problems with hemostasis, in some cases temporary states due to ingestion of prescribed drugs, and no correlation between work history and hemostasis was found. R.D.V.

A76-38706 # Motivational problems in candidate pilots (Sul problema motivazionale in aspiranti piloti). F. Sparvieri. (NATO, AGARD, Aerospace Medical Panel Specialists Meeting, 32nd, Ankara, Turkey, Oct. 21-24, 1975.) *Rivista di Medicina Aeronautica e Spaziale*, vol. 38, Oct.-Dec. 1975, p. 433-444. In Italian.

The paper presents a comparative examination of the answers to questions reported in a biographical questionnaire submitted to 104 candidate pilots and 111 candidate engineers, in occasion of a competition for admission to the Italian Air Force Academy. The results of this investigation support the opinion that candidate pilots are, in general and in comparison to candidate engineers, less inclined to long-lasting and rigorous learning activities and are characterized by a greater frankness and a lesser conformity. (Author)

A76-38707 # Notes on flight-related psychosyndromes, in particular phobic syndromes (Considerazioni sulle psicosindromi connesse al volo, con particolare riguardo a quelle fobiche). E. D'Antino. *Rivista di Medicina Aeronautica e Spaziale*, vol. 38, Oct.-Dec. 1975, p. 448-473. 34 refs. In Italian.

Several classifications of work-related phobias are presented, generally following the lines of Misenard et al. (1967). Phobias in general, phobias related to work and fatigue, secondary phobic syndromes deriving from work-related psychic traumata or from neurotic processes independent of work are considered. Symptomatology of psychic fatigue and exhaustion are outlined, along with psychogenic reactions, paroxysmic anxiety episodes, and flight-related floating anxieties. Prophylaxis and therapy of flight-related psychosyndromes are considered briefly. R.D.V.

A76-38801 Glucagon and plasma catecholamines during beta-receptor blockade in exercising man. H. Galbo, J. J. Holst, N. J. Christensen, and J. Hilsted (Copenhagen, University; Bispebjerg Hospital, Copenhagen; Kommunehospitalet, Aarhus, Denmark). *Journal of Applied Physiology*, vol. 40, June 1976, p. 855-863. 37 refs. Research supported by the Danish Medical Research Council and Idrættens Forskningsrad.

Seven men ran at 60% of individual maximal oxygen uptake to exhaustion during beta-adrenergic blockade with propranolol (P), during lipolytic blockade with nicotinic acid (N), or without drugs (C). The total work times differed significantly. Epinephrine rose progressively above pre-exercise levels; at exhaustion concentrations in P experiments were larger than in N and C experiments. Norepinephrine increased consistently while insulin decreased. After an initial decrease glucagon concentrations increased progressively in parallel with declining plasma glucose and were at exhaustion always three times pre-exercise values. Thus beta-adrenergic blockade did not diminish the glucagon response. Nor was this response increased when alpha-receptor stimulation in P experiments was intensified. Carbohydrate combustion was smaller and nonesterified fatty acids (NEFA) and glycerol concentrations in serum larger during C experiments. Alanine concentrations were never raised at exhaustion. Accordingly, neither stimulation of adrenergic receptors nor NEFA and alanine concentrations are major determinants for the exercise-induced glucagon secretion in man. It is suggested that decreased glucose availability enhances the secretion of glucagon and epinephrine during prolonged exercise. (Author)

A76-38802 Respiratory and other responses in subjects immersed in cold water. K. E. Cooper, S. Martin, and P. Riben (Calgary, University, Calgary, Alberta, Canada). *Journal of Applied Physiology*, vol. 40, June 1976, p. 903-910. 11 refs. Research supported by the Defence Research Board of Canada; Contract No. N00014-72-C-0098.

Subjects have been immersed in water at 27 C and 10 C and while immersed their respiratory rates, minute volumes, and end-tidal CO₂ partial pressure levels were measured. Measurements were made with the subjects at rest, exercising at approximately 0.8 liter oxygen/min, and very vigorously at 1.8-2.0 liters oxygen/min. Immersion in the cold water caused an increase in respiratory rate and a fall in end-tidal CO₂. At the moderate rate of exercise the hyperventilation persisted in relation to the oxygen demand and there was still a significant reduction in end-tidal CO₂. At the greatest rates of exercise, the end-tidal CO₂ did not differ from that obtained in similar rates of exercise in warm water. Preheating the subject in a sauna so as to increase skin temperature, with minimal change in body temperature, greatly attenuated the ventilatory and end-tidal CO₂ responses to cold water immersion. (Author)

A76-38803 * Plasma vasopressin and renin activity in women exposed to bed rest and +G/z acceleration. L. C. Keil and S. Ellis (NASA, Ames Research Center, Biomedical Research Div., Moffett Field, Calif.). *Journal of Applied Physiology*, vol. 40, June 1976, p. 911-914. 24 refs.

To study the effect of prolonged recumbency on plasma vasopressin and renin activity, eight women were subjected to 17 days of absolute bed rest. The tolerance to +3G vertical acceleration of the subjects was tested before and after 14 days of bed rest. From day 2 and through day 17 of bed rest, plasma arginine vasopressin (AVP) levels were reduced 33%. Plasma renin activity (PRA)

increased 91% above ambulatory control values from days 10 through 15 of bed rest. When compared to precentrifuge values, exposure to vertical acceleration prior to bed rest provoked a 20-fold rise in mean plasma AVP but resulted in only a slight increase in PRA. After bed rest, acceleration increased plasma AVP 7-fold; however, the magnitude of this increase was less than the post +3G acceleration value obtained prior to bed rest. After bed rest, no significant rise was noted in PRA following +3G acceleration. This study demonstrates that prolonged bed rest leads to a significant rise in the PRA of female subjects, while exposure to positive vertical acceleration provokes a marked rise in plasma AVP. (Author)

A76-38930 Orthogonal electrocardiogram, apex cardiogram, and atrial sound in normotensive and hypertensive 50-year-old men. J. Wikstrand, G. Berglund, L. Wilhelmsen, and I. Wallentin (Göteborg, Universitet, Göteborg, Sweden). *British Heart Journal*, vol. 38, Aug. 1976, p. 779-789. 36 refs. Research supported by the Swedish National Association against Heart and Chest Diseases and Bank of Sweden; Swedish Medical Research Council Grants No. K73-19X-4131-01; No. B74-19X-4229-01A.

A76-38990 Acute changes in animal inner ears due to simulated sonic booms. S. Reinis (Waterloo, University, Waterloo, Ontario; Toronto, University, Toronto, Canada). *Acoustical Society of America, Journal*, vol. 60, July 1976, p. 133-138. 17 refs. Research supported by the Ministry of Transport of Canada and Transportation Development Agency.

Experiments were conducted on C57BL/6J inbred male mice which were subjected to simulated sonic booms of different rise time, intensity, and number of sonic booms. The paper describes one pathological finding in the inner ears of the mice, viz., bleeding into the scala tympani in the basal turn of the cochlea. Even a single superboom of 10-psf peak overpressure and a 5-msec rise time, or a single boom having a short rise time of 0.1 msec and a peak overpressure of 3.3 psf, causes this pathological change. The effects of a short series of simulated sonic booms can be cumulative, as two or more booms administered at 10-sec intervals can cause bleeding, whereas one does not. In addition, only five successive booms at a rate of one every 24 hr produced a cumulative effect. The main cause of bleeding in the scala tympani is probably a mechanical stretching of the basilar membrane, resulting in the rupture of either the outer or inner spiral blood vessels located on the tympanic side of the basilar membrane. S.D.

A76-39009 Neutron diffraction studies of retinal rod outer segment membranes. H. Saibil (King's College, London, England), M. Chabre (Commissariat à l'Energie Atomique, Centre d'Etudes Nucléaires de Grenoble, Grenoble, France), and D. Worcester (Atomic Energy Research Establishment, Materials Physics Div., Harwell, Berks., England). *Nature*, vol. 262, July 22, 1976, p. 266-270. 18 refs. Research supported by the Centre National de la Recherche Scientifique and Délégation Générale à la Recherche Scientifique et Technique.

Neutron diffraction measurements on isolated retinal rod outer segments show that most of the visual pigment protein, rhodopsin, is embedded in the hydrophobic core of the disk membrane. A very slight outward shift of protein at the cytoplasmic side of the membrane is associated with pigment bleaching. (Author)

A76-39207 Physiology of emotion (Fiziologija emotsii). Edited by L. P. Latash and G. A. Stepanikii. Moscow, VINITI (Itogi Nauki i Tekniki, Seriya Fiziologiya Cheloveka i Zhivotnykh. Volume 15), 1975. 155 p. In Russian.

This collection of three reviews deals with emotional reinforcement and its neurophysiological mechanisms, emotions as related to the significance of some mediators and hormones in the mechanisms underlying the onset and maintenance of emotional states, and emotions and sleep. The first review emphasizes the brain substrate

of self-stimulation along with the polyvalent effects of stimulation and the role of ecological and ethological factors in behavior. The second review characterizes essentially the participation of biogenic amines in the processes of initiation of emotional states, including emotional stress. The third review is mainly concerned with the interrelationships of emotional processes and sleep as an active state of the brain whose fulfillment depends on the activity of the cerebral structure of emotions. S.D.

A76-39397 * Closed system Fischer-Tropsch synthesis over meteoritic iron, iron ore and nickel-iron alloy. D. W. Nooner, J. M. Gibert, E. Gelpi, and J. Oro (Houston, University, Houston, Tex.). *Geochimica et Cosmochimica Acta*, vol. 40, Aug. 1976, p. 915-924. 34 refs. Grant No. NCA2-OP295-501.

Experiments were performed in which meteoritic iron, iron ore and nickel-iron alloy were used to catalyze (in Fischer-Tropsch synthesis) the reaction of deuterium and carbon monoxide in a closed vessel. Normal alkanes and alkenes and their monomethyl substituted isomers and aromatic hydrocarbons were synthesized. Iron oxide and oxidized-reduced Canyon Diablo used as Fischer-Tropsch catalysts were found to produce aromatic hydrocarbons in distributions having many of the features of those observed in carbonaceous chondrites, but only at temperatures and reaction times well above 300 C and 6-8 h. B.J.

A76-39548 A multistable movement display - Evidence for two separate motion systems in human vision. A. Pantle and L. Picciano (Miami University, Oxford, Ohio). *Science*, vol. 193, Aug. 6, 1976, p. 500-502. 10 refs. Contract No. F33615-74-C-4032.

Two competing sensations of apparent movement were produced by the rapid alternation of two multielement stimulus frames. Either sensation could be made dominant by appropriate manipulations of the stimulus display. The results suggest that there are two systems capable of generating movement signals in man. One system depends on preliminary processing of form, and the second system does not. (Author)

A76-39549 # Anxiety and performance - A study concerning the prediction of predictability (Ängstlichkeit und Leistung - Eine Untersuchung zur Vorhersage der Vorhersagbarkeit). H. Giesen (Deutsches Institut für internationale pädagogische Forschung, Frankfurt am Main, West Germany), T. Ehlers, and M. Geyer (Marburg, Universität, Marburg an der Lahn, West Germany). *Zeitschrift für experimentelle und angewandte Psychologie*, vol. 23, 2nd Quarter, 1976, p. 175-189. 29 refs. In German.

An investigation is conducted regarding the moderator effect of the personality trait 'anxiety' on the predictability of the performance of students. A hypothesis concerning the relation between anxiety and performance predictability is considered and a description is given of tests conducted with university and high-school students. The test results show that the degree of predictability in the case of students with a medium anxiety level is better than the predictability value obtained for students with low and high anxiety levels. The differences in predictability appear to be more pronounced for female students. G.R.

A76-39550 # Learning in the case of aversion-related signal concepts under conditions of avoidance and nonavoidance of the aversive situation (Zum Lernen von aversionsbezogenen Signal-konzepten unter den Bedingungen Vermeidung und Nichtvermeidung der aversiven Situation). U. Grau (München, Technische Universität, Munich, West Germany). *Zeitschrift für experimentelle und angewandte Psychologie*, vol. 23, 2nd Quarter, 1976, p. 190-218. 34 refs. In German.

The possibility of a learning of acts which are designed to avoid pain stimuli is considered and a study is conducted regarding the effect of such a possibility on the acquisition of signal concepts for the aversion-related subsequent event and the neutral subsequent stimuli. The results of tests conducted with two groups of subjects

suggest that the avoidance motive can, under certain conditions, interfere with the information intake. G.R.

A76-39576 Space flight effects on the skeletal muscles of rats. E. I. Il'ina-Kakueva, V. V. Portugalov, and N. P. Krivenkova (Ministerstvo Zdravookhraneniia SSSR, Institut Mediko-Biologicheskikh Problem, Moscow, USSR). *Aviation, Space, and Environmental Medicine*, vol. 47, July 1976, p. 700-703. 6 refs.

Morphological and histochemical examinations of the skeletal muscles of rats flown for 22 d aboard the Cosmos-605 biosatellite have demonstrated atrophic and dystrophic developments in the soleus muscle accompanied by metabolic changes in the muscle tissue. The changes were reversible but did not disappear entirely 27 d postflight. Early atrophic developments were seen in the m. gastrocnemius, m. quadriceps, and m. ext. digitorum longus on the second postflight day. The comparative study of the muscles of flight and simulation rats has shown that pathology developed in the muscles as a result of diminished motor activity of animals being aggravated by weightlessness. (Author)

A76-39577 Cytochemical investigations of proteins and RNA in spinal motoneurons and neurons of spinal ganglia of the rat after space flight. A. V. Gorbunova and V. V. Portugalov (Ministerstvo Zdravookhraneniia SSSR, Institut Mediko-Biologicheskikh Problem, Moscow, USSR). *Aviation, Space, and Environmental Medicine*, vol. 47, July 1976, p. 708-710. 22 refs.

A76-39578 Cardiac pathology associated with high sustained +G/z. I - Subendocardial hemorrhage. R. R. Burton and W. F. MacKenzie (USAF, School of Aerospace Medicine, Brooks AFB, Tex.). *Aviation, Space, and Environmental Medicine*, vol. 47, July 1976, p. 711-717. 19 refs.

Adult miniature swine were exposed to various levels and durations of +G/z (positive vertical acceleration). After exposure, all swine were euthanized and necropsied. Gross, histologic, and electron microscopic observations were made on the heart tissue. Subendocardial hemorrhage (SEH) was commonly found in the left ventricle, rarely in the right ventricle, and its severity was directly related to the level and duration of G exposure, heart rate, and catecholamine activity. SEH was made more severe with i.v. atropine 4 mg, and prevented with i.v. propranolol 20 mg. Heart hemorrhage was usually limited to the immediate subendocardial region and frequently surrounded Purkinje's fibers. In severe cases, however, hemorrhages penetrated several millimeters into the heart muscle and sometimes penetrated Purkinje's fibers. Restraint of unanesthetized swine in the centrifuge couch, low G-levels, and/or i.v. injections of atropine or epinephrine produced minimal SEH lesions. (Author)

A76-39579 Cardiac pathology associated with high sustained +G/z. II - Stress cardiomyopathy. W. F. MacKenzie, R. R. Burton, and W. I. Butcher (USAF, School of Aerospace Medicine, Brooks AFB, Tex.). *Aviation, Space, and Environmental Medicine*, vol. 47, July 1976, p. 718-725. 45 refs.

The myocardial pathology of 14 pigs exposed to high sustained vertical acceleration stress of 9 and 15, or 3, 7, and 9 G was studied; six control pigs were used as comparisons. Four pigs received propranolol prior to centrifugation and four pigs received atropine. Hearts were studied by light and electron microscopy. Myocardium from stressed pigs showed myofibrillar degeneration, pooling of mitochondria, and cell death. Lesions occurred in random cells of the subendocardium and papillary muscles. Purkinje fibers were also involved. Pretreatment with atropine increased the number of dead cells found and propranolol increased the number of cells showing myofibrillar degeneration. It is postulated that this is a pluricausal cardiomyopathy similar to several experimental conditions. Significance to aerospace medicine is briefly discussed. (Author)

A76-39580 Changes in clinical cardiologic measurements associated with high +G/z stress. K. K. Gillingham and P. P. Crump

(USAF, School of Aerospace Medicine, Brooks AFB, Tex.). *Aviation, Space, and Environmental Medicine*, vol. 47, July 1976, p. 726-733. 28 refs.

The effects of high vertical acceleration on cardiac function were studied in two groups of subjects using noninvasive techniques (ECGs, vectorcardiograms, systolic time intervals, maximal treadmill stress tests). In a group exposed to three 40 sec runs at 8 G and two 40 sec runs at 10 G in one day, moderate cutaneous petechias developed, serum total CPK and LSH levels rose, and the pre-ejection period decreased 48 hr post-stress. A similar decrease in pre-ejection period was observed in subjects exposed to one 100 sec variable G maneuver peaking twice at 8 G for 3 sec, once a week for three weeks. There were transient T-loop angle changes. It is concluded that there is no clear evidence of compromised cardiac performance resulting from the G stress imposed in these studies. C.K.D.

A76-39581 Space flight effects on skeletal bones of rats - Light and electron microscopic examination. V. S. Iagodovskii, L. A. Trifanidi, and G. P. Gorokhova (Ministry of Health, Central Research Institute of Traumatology and Orthopedics, Moscow, USSR). *Aviation, Space, and Environmental Medicine*, vol. 47, July 1976, p. 734-738. 21 refs.

Long tubular bones of Wistar rats that were flown for 22 d onboard the Cosmos-605 biosatellite and were exposed to a ground-based simulation experiment were examined in light and electron microscopes. About half of the flight rats showed osteoporosis of metaphyses which was usually combined with a decrease of the mass of the primary spongiosa in the vicinity of the epiphyseal cartilaginous plate. This gives evidence that the growth of the bones could have been inhibited in flight. The light and electron microscopy of bones of flight rats revealed wide osteocyte lacunae which could have been produced by perilacunar osteolysis. In the simulation experiment, reduction in the metaphyseal spongiosa occurred only in one-third of the rats and was less pronounced than in flight rats; no decrease of the mass of the primary spongiosa near the cartilaginous plate was noted. Histological investigation of bones 27 d postflight demonstrated that that time period was not enough to eliminate all the changes in the bones tested. (Author)

A76-39582 Effect of pre-adapting spectral stimuli on visual responses. G. T. Chisum (U.S. Naval Material Command, Naval Air Development Center, Warminster, Pa.). *Aviation, Space, and Environmental Medicine*, vol. 47, July 1976, p. 739-745. 6 refs.

Electroretinograms (ERGs) were recorded following preadapting exposures to radiometrically and photometrically matched spectral stimuli. The magnitudes of three aspects of the ERG varied as a function of the adapting wavelength. Longer wavelength preadapting stimuli produced less suppression of the response magnitudes than stimuli from the short wavelength end of the spectrum. The implications of the findings for display design and cockpit-light-source design and management are discussed. (Author)

A76-39583 Space flight effects on the hemopoietic function of bone marrow of the rat. V. N. Shvets and V. V. Portugalov (Ministerstvo Zdravookhraneniia SSSR, Institut Mediko-Biologicheskikh Problem, Moscow, USSR). *Aviation, Space, and Environmental Medicine*, vol. 47, July 1976, p. 746-749.

The 22-d orbital flight of rats onboard the Cosmos-605 biosatellite was followed by inhibition of erythroblastosis, alteration in the morphology of megakaryocytes, and stimulation of myelopoiesis. These changes returned to normal 27 d postflight. The colony-forming capacity and pattern of differentiation of hemopoietic stem cells of bone marrow of flight rats remained undisturbed. (Author)

A76-39584 * Cardiovascular function during sustained +G/z stress. H. H. Erickson, H. Sandler, and H. L. Stone (NASA,

Ames Research Center, Moffett Field, Calif.; USAF, School of Aerospace Medicine, Brooks AFB, Texas, University, Galveston, Tex.). *Aviation, Space, and Environmental Medicine*, vol. 47, July 1976, p. 750-758. 29 refs. NASA Order A-94544.

The development of aerospace systems capable of very high levels of positive vertical accelerators stress has created a need for a better understanding of the cardiovascular responses to acceleration. Using a canine model, the heart and cardiovascular system were instrumented to continuously measure coronary blood flow, cardiac output, left ventricular and aortic root pressure, and oxygen saturation in the aorta, coronary sinus, and right ventricle. The animals were exposed to acceleration profiles up to +6 G, 120 s at peak G; a seatback angle of 45 deg was simulated in some experiments. Radiopaque contrast medium was injected to visualize the left ventricular chamber, coronary vasculature, aorta, and branches of the aorta. The results suggest mechanisms responsible for arrhythmias which may occur, and subendocardial hemorrhage which has been reported in other animals. (Author)

A76-39585 Application of hyperbaric oxygen therapy in a case of prolonged cerebral hypoxia following rapid decompression. P. J. Sheffield and J. C. Davis (USAF, School of Aerospace Medicine, Brooks AFB, Tex.). *Aviation, Space, and Environmental Medicine*, vol. 47, July 1976, p. 759-762. 20 refs.

The use of hyperbaric oxygen (HBO) in the treatment of prolonged cerebral hypoxia is reported in an incident involving a USAF T-39 aircraft that underwent rapid decompression from 753 mb (2438 m) to 148 mb (13,716 m). Within 5 to 8 s, the pilot lost consciousness because he did not don his oxygen mask and, therefore, was unable to obtain supplemental oxygen immediately. After a delay of 6 to 8 min, he was given supplemental oxygen at and below 697 mb (3048 m). On the ground, the pilot was blind and disoriented. This condition persisted for 6.5 h, at which time HBO was administered. Orientation and vision were regained; neurologic findings were negative. It is concluded that HBO therapy was effective in treating this case of prolonged cerebral hypoxia. The report shows the potential application of HBO in the treatment of prolonged cerebral hypoxia, and demonstrates the need for developing safe procedures for descent of passenger aircraft following such decompressions. (Author)

A76-39586 Effects of time zone changes on performance and physiology of airline personnel. F. S. Preston, S. C. Bateman, F. W. Meichen, R. Wilkinson, and R. V. Short (British Airways, Medical Service, Heathrow Airport; E. Merck, Ltd., London; Medical Research Council, Applied Psychology Unit, Cambridge, England; Medical Research Council, Reproductive Biology Unit, Edinburgh, Scotland). *Aviation, Space, and Environmental Medicine*, vol. 47, July 1976, p. 763-769. 5 refs.

The effect of time zone changes on the performance and menstrual cycles of 16 airline personnel was investigated. Three groups of four women each were subjected to two 8 hr time retardations over a period of four days, simulating westerly flight; an additional group of four women served as a control. Mepiprazole hydrochloride was administered to some subjects. Results showed impaired performance in individuals subjected to time zone changes. These were associated with severe sleep loss and may have been aggravated by the fact that the circadian cycle of body temperature was fairly well maintained, so that some work periods were carried out when body temperature was low. This effect is more pronounced in westerly flights than in easterly flights. There were no significant changes in menstrual cycle, and the drug failed to alleviate the effects of time zone change. C.K.D.

A76-39587 Psychotherapy and return to flying duties. C. B. Steinbacher and C. J. G. Perry (USAF, School of Aerospace Medicine, Brooks AFB, Tex.). *Aviation, Space, and Environmental Medicine*, vol. 47, July 1976, p. 770-772. 10 refs.

A study was made of 112 cases referred to the USAF School of Aeronautical Medicine for psychiatric consultation. In 58 cases the

patient was disqualified from flight duty on psychiatric grounds. Of the 49 cases for which follow-up information was available, 38 received treatment; 18 of these eventually returned to flight duty, along with six who did not receive treatment. The high percentage of salvaged flight personnel (49%) indicates that current psychiatric illness or a history of psychiatric illness is not sufficient reason, in and of itself, to permanently disqualify trained personnel from flight duties. C.K.D.

A76-39588 Resonance ultrasonic measurements of microscopic gas bubbles. J. W. Horton (IBM Scientific Center, Palo Alto, Calif.) and C. H. Wells (Texas, University, Galveston, Tex.). *Aviation, Space, and Environmental Medicine*, vol. 47, July 1976, p. 777-781. 10 refs. Contract No. N00014-68-A-0105-0003.

A pulsed, ultrasonic echo-ranging system employing the principle of bubble resonance for the location and identification of stationary or moving bubbles in the tissues of living organisms is described. The device is based on a piezoceramic transducer which is electromagnetically resonant at 230 kHz. The damping constant of the piezoceramic element was selected to approximate that of a resonant hydrogen bubble in water. Computer-processed echoes from bubbles in a water bath or introduced into the jugular veins of anesthetized dogs displayed a characteristic line-narrowing in the Fourier domain. Changes in signal frequency allow identification of bubbles in a wide size range. C.K.D.

A76-39683 Structure and properties of a single channel in the human visual system. H. Mostafavi and D. J. Sakrison (California, University, Berkeley, Calif.). *Vision Research*, vol. 16, no. 9, 1976, p. 957-968. 6 refs. NSF Grant No. GK-37282.

Previous experiments have indicated that the visual system can be represented as a collection of parallel channels with detection occurring whenever activity in any one of these channels reaches a certain level. In this paper we examine the structure of such a channel and show that it must be represented by an incoherent, rather than a coherent, type of detection. We then examine the following properties of the detection mechanism of a single channel: the angular bandwidth, the radial bandwidth, and the nonlinearity involved in the incoherent detection operation. (Author)

A76-39684 Perceptual latencies to sinusoidal gratings. U. Lupp, G. Hauske, and W. Wolf (München, Technische Universität, Munich, West Germany). *Vision Research*, vol. 16, no. 9, 1976, p. 969-972. 18 refs. Research supported by the Deutsche Forschungsgemeinschaft.

Simple visual reaction time (RT) to suprathreshold sinusoidal gratings was determined as a measure of perceptual latency. As parameters, spatial frequency, exposure duration and modulation were varied. With three subjects, RT was found to increase with increasing spatial frequency. High contrast gives shorter RTs than low contrast. In the range investigated the effect of contrast is small compared with that of spatial frequency. At constant spatial frequency exposure durations of 30-60 msec produce shortest RTs. Underlying physiological mechanisms are considered. Some evidence comes from different temporal behavior of X- and Y-system but central mechanisms are also supposed to be involved. (Author)

A76-39685 The significance of frequency gradients in binocular grating perception. H. R. Wilson (Chicago, University, Chicago, Ill.). *Vision Research*, vol. 16, no. 9, 1976, p. 983-989. 13 refs.

It has previously been reported that when pairs of sinusoidal spatial gratings of slightly different frequencies are viewed stereoscopically, subjects perceive a plane tilted in depth. This result was assumed to provide evidence for the operation of a narrow band, Fourier analysis type of mechanism in binocular vision. When any uniformly textured surface is physically rotated in depth, however, texture gradients are introduced into the monocular projections. Experiments were performed to compare the tilt effect obtained with sinusoidal gratings to that obtained when appropriate spatial

frequency gradients were present. In all cases the frequency gradient patterns were more effective in producing the tilt effect. As these patterns have broad band Fourier spectra, it is argued that the results cannot be accounted for by narrow band Fourier models of the binocular vision. An explanation is then offered in terms of the spatial inhomogeneity of the human visual system. (Author)

A76-39686 Visual detection of patterns periodic in two dimensions. G. J. Burton (Imperial College of Science and Technology, London, England). *Vision Research*, vol. 16, no. 9, 1976, p. 991-998. 27 refs.

Single- and multiple-channel models, proposed in earlier investigations of visual contrast threshold detection of linear patterns, are extended to apply to two-dimensional space. It is shown that such models do not provide accurate predictions of contrast threshold values of patterns with two-dimensional structure. It is suggested that detection mechanisms exist which are size-tuned in both dimensions. (Author)

A76-39687 Evoked potentials and visual acuity (Potentiels évoqués et acuité visuelle). Y. Grail, F. Rigaudière, S. Delthil, J. F. Legargasson, and J. Sourdille (Paris VII, Université, Paris; Institut National de la Santé et de la Recherche Médicale, St. Denis, Seine-St-Denis, France). *Vision Research*, vol. 16, no. 9, 1976, p. 1007-1012. 45 refs. In French.

A method is presented to aid an objective appraisal of visual acuity, demonstrating coincidence in the perception of a significant detail and analysis of visual evoked potentials resulting from that perception. A stimulator displaying an invertible checkerboard pattern and constant luminance is employed in the method, for quantifying the results. Eighty percent agreement with other tests is obtained in the case of patients suffering from various ophthalmic irregularities, the other 20 percent being associated with disturbances of visual function reflected in EEG. Possible improvements in the method are suggested. R.D.V.

A76-39688 Spatial pooling properties deduced from the detectability of FM and quasi-AM gratings - A reanalysis. N. Graham and B. E. Rogowitz (Columbia University, New York, N.Y.). *Vision Research*, vol. 16, no. 9, 1976, p. 1021-1026. 15 refs.

Arguments advanced by Stromeyer and Klein (1975) on models of spatial pattern detection and spatial pooling mechanisms, using three distinct types of grating - sinusoidal, FM, and quasi-AM gratings are challenged. It is claimed that the simple sinusoidal and FM gratings are not psychophysically equally detectable. Properties of the receptive fields of neural units, stimulation maps, symmetry properties, pure peak detection, and spatial pooling discussed by other authors are reviewed critically. Models with different bandwidth, spatial pooling, and probability summation characteristics are considered, but the reanalysis is restricted to the model entertained by Stromeyer and Klein. R.D.V.

A76-39710 # Measuring the magnetic fields of the human heart, brain, muscles, and lungs (Mereni magnetických poli lidského srdce, mozku, svalů a plic). M. Odehnal and V. Petricek (Ceskoslovenská Akademie Věd, Ústav Jaderne Fyziky, Prague, Czechoslovakia). *Ceskoslovenský časopis pro fyziku, Sekce A*, vol. 26, no. 3, 1976, p. 254-269. 31 refs. In Czech.

The paper sets forth elementary theory of the electric and magnetic field vectors of the heart and describes some experimental setups for detection of magnetic fields surrounding the human heart, brain, muscles and lungs. Results of recent biomagnetic experiments are summarized. A mathematical model of the electric and magnetic phenomena in the heart is proposed, and a demonstration of how a magnetic field could be induced around the heart reveals that it is possible that a magnetocardiogram can contain some information not recorded in the ECG. The block diagram of a superconducting quantum magnetometer is shown and discussed, and its promise for measuring magnetic field gradients is evaluated. P.T.H.

A76-39714 Canadian remote manipulator system for NASA Space Shuttle. I. Reid. *Engineering Journal*, vol. 59, May-June 1976, p. 12, 13.

Contracts for the preliminary design of a Shuttle Remote Manipulator System (SRMS) and for the design and construction of a simulation facility have been awarded to a Canadian four-company team. The servo-operated SRMS will provide capability for maneuvering payloads measuring up to 60 ft in length and 15 ft in diameter, and must be able to deploy a 32,000 lb payload within a tight time frame. The 50-foot jointed arm will be operated in either automatic or manual modes. Also under development is a Module Exchange Manipulator, which will remove and replace modules in orbiting satellites. Full-sized demonstration hardware has been successfully tested. C.K.D.

A76-39727 # Application of digital filtering and data compression to biomedical signal processing and telemetry. V. Cappellini, E. Del Re, A. Evangelisti, and M. Pastorelli (Firenze, Università, Florence, Italy). *International Federation for Medical and Biological Engineering, International Congress on Medical and Biological Engineering, 11th, Ottawa, Canada, Aug. 2-6, 1976, Paper. 3 p.*

The application of some digital filtering and data compression methods to processing and telemetering biomedical signals is described. Special digital filters of nonrecursive and recursive type, having high efficiency, are proposed. Two data compression methods are described: one using an adaptive prediction method with two amplitude tolerances and the other using first-order spline functions. Experimental results, obtained in processing ECG signals, are reported: compression ratios in the range of 2 to 10 are obtained with rms and peak errors in the range of 1 to 7 per cent. (Author)

A76-39757 X-ray 3-D coded aperture imaging - Displaying the heart. E. Klotz and H. Weiss (Philips Forschungslaboratorium Hamburg GmbH, Hamburg, West Germany). *Applied Optics*, vol. 15, Aug. 1976, p. 1913-1918. Research supported by the Bundesministerium für Forschung und Technologie. BMFT Project LMB-741.

The coded aperture imaging technique using an array of X-ray sources for display of three-dimensional objects is applied to a relevant medical object: the coronal vascular system of an isolated heart filled with contrast medium, coded according to a non-redundant point distribution. Arbitrary layers of the heart are decoded by correlation using a holographic system. The course of the vessels in the third dimension can clearly be followed, thus presenting a completely novel tool of medical diagnosis. (Author)

A76-39850 # A study of handling quality assessment in manual control system. M. Abe (Jizai-Engineering Co., Ltd., Tokyo, Japan) and O. Hirao (Tokyo, University, Tokyo, Japan). *Tokyo, University, Institute of Industrial Science, Report*, vol. 25, Jan. 1976, p. 81-105. 33 refs. In Japanese, with abstract in English.

Analytical methods are proposed to facilitate a quantitative formalization of the evaluation of automobile handling qualities and design parameters affecting the dynamic properties of an automobile as a human-machine system. The human part of the relations is derived from work based on aircraft pilot ratings, and the vehicle is treated as a linear feedback control system. A transfer function is developed for the ideal optimally trained and functioning human driver. Analytical techniques developed in the study are applied to the handling qualities of a VTOL aircraft in a hover mode. The results are compared to a comparative NASA experimental study, and good agreement is found. R.D.V.

A76-40111 # On the detection of the magnetic heart vector - An application of the reciprocity theorem. J. Malmivuo (Helsinki University of Technology, Otaniemi, Finland). *Acta Polytechnica Scandinavica, Electrical Engineering Series*, no. 39, 1976. 112 p. 71 refs. NSF Grant No. APR-72-03447-A03.

Lead field theory was used to develop two new lead systems (the ABC lead system and the unipositional lead system) for detecting the magnetic heart vector. A mathematical model was

developed for determining the spatial sensitivity of SQUID magnetometers for distributed current sources in infinite homogeneous volume conductors. The effects of the boundaries and inhomogeneities in a typical thorax on the lead fields were studied with model experiments. A new method based on the reciprocity theorem was developed for performing these experiments with two-dimensional heart-thorax models. It was found that the unipositional lead system meets the requirements for a clinical MCG lead system and is therefore suggested for use in determining the diagnostic performance of magnetocardiography. B.J.

A76-40127 Jet lag isn't just a state of mind. R. Rowan. *Fortune*, vol. 94, Aug. 1976, p. 140-145, 197, 198, 200, 202.

The symptoms and possible causes of circadian dysrhythmia - jet lag - are discussed. Circadian dysrhythmia manifests itself as physical fatigue coupled with irritability, a shortened attention span, decreased libido and increased anxiety. Other harmful effects of prolonged flights not properly classified as symptoms of jet lag are dehydration of the respiratory passageways and ocular fluids and relative hypoxia. The adjustment period varies with the length and direction of flight, and is of different duration for individual body rhythms. Among the possible remedies and preventatives for circadian dysrhythmia currently under investigation are flurazepam, lithium compounds, vitamins, and theophylline. C.K.D.

A76-40128 Compositional nonrandomness - A quantitatively conserved evolutionary invariant. R. Holmquist and H. Moise (California, University, Berkeley, Calif.). *Journal of Molecular Evolution*, vol. 6, Oct. 3, 1975, p. 1-14. 10 refs.

Statistical methods were applied to investigate the non-randomness of 78 protein families comprising 169 individual proteins for which amino acid sequences have been reported in the literature. The quantity Q (Holmquist, 1975), which has a direct physical interpretation as the number of amino acid residues per unit protein length in excess or deficit of that predicted from the genetic table normalized to a standard length of 100 residues, was adopted as a quantitative measure of overall nonrandomness. Results show that the probability that the amino acid composition of a protein will exhibit a given deviation from the genetic code table frequencies is the same for all protein families regardless of length, biological function, or species of origin. The standard deviation and mean of the probability distribution are stable about the values of 10 and 24, respectively. On the basis of this evidence, it is hypothesized that molecular evolution is the resultant of two coupled processes in balance, one selective and one stochastic. C.K.D.

A76-40129 * Cyanogen induced phosphorylation of D-fructose. Ch. Degani, M. Kawatsui, and M. Halmann (Weizmann Institute of Science, Rehovot, Israel). *Journal of Molecular Evolution*, vol. 6, Oct. 3, 1975, p. 51-60. 32 refs. Grant No. NGR-33-006-070.

It has been demonstrated that a phosphorylated sugar, identified as alpha-D-fructopyranose, can be formed as the result of cyanogen-induced phosphorylation of D-fructose at pH 8.8. The product was isolated from barium and cyclohexylammonium salts and identified on the basis of its chromatographic and electrophoretic properties, its lability to hydrolysis by alkaline phosphatase, the rate of its acid-catalyzed hydrolysis, and the results of periodate oxidation and optical rotatory measurements. These results support the suggestion that the cyanogen-induced phosphorylation of free sugars could be a possible process for formation of sugar phosphates under prebiotic conditions (Halman et al., 1969). (Author)

A76-40130 * On the origin of molecular 'handedness' in living systems. H. P. Noyes and W. A. Bonner (Stanford University, Stanford, Calif.). *Journal of Molecular Evolution*, vol. 6, Oct. 29, 1975, p. 65-98. 21 refs. AEC-supported research; Grant No. NGL-05-020-582.

Elementary particle effects (beta-decay) provide only a weakly handed radiation in the biologically effective energy ranges. Global

magnetic effects coupled to sunlight are randomized by paleomagnetic reversals. A persistent terrestrial handed bias at possible local biopoetic sites offers a more promising explanation for the origin of the 'handedness' of the molecules found among living systems on earth. Magnetite in lava flows maintains a handed bias for surface catalysis through many magnetic reversals. Indirect evidence for the hypothesis that magnetite contaminated with sulfur is a possible biopoetic site (Granick, 1957) has been provided by the molecular structure of ferredoxin - a single strand of the 14 primordial amino acids wrapped around an FeS core. Lava flows have been suggested as biopoetic sites by Fox (1964), since their temperature and chemical composition might allow for the rapid synthesis of prebiotic compounds at the surface of the primitive earth. The additional fact that magnetite in lava flows also provides a persistent handed site for surface catalysis offers a further argument for the experimental investigation of this specific biopoetic environment. (Author)

A76-40131 Crystallization and solid-state reaction as a route to asymmetric synthesis from achiral starting materials. B. S. Green and M. Lahav (Weizmann Institute of Science, Rehovot, Israel). *Journal of Molecular Evolution*, vol. 6, Oct. 29, 1975, p. 99-115. 70 refs.

Many molecules which are achiral can crystallize in chiral (enantiomorphic) crystals and, under suitable conditions, crystals of only one chirality may be obtained. The formation of right- or left-handed crystals in excess is equally probable. Lattice-controlled (topochemical) photochemical or thermal solid-state reactions may then afford stable, optically active products. In the presence of the chiral products, achiral reactants may preferentially produce crystals of one chirality, leading to a feedback mechanism for the generation and amplification of optical activity. Amplification of optical activity can also be achieved by solid-state reactions. The optical synthesis of biologically relevant compounds by such routes may be envisaged. (Author)

A76-40132 * Prebiotic peptide-formation in the solid state. II - Reaction of glycine with adenosine 5 prime-triphosphate and P1, P2-diadenosine-pyrophosphate. H. Sawai, R. Lohrmann, and L. E. Orgel (Salk Institute for Biological Studies, San Diego, Calif.). *Journal of Molecular Evolution*, vol. 6, Nov. 4, 1975, p. 165-184. 19 refs. NSF Grant No. GP-38774X; Grant No. NGR-05-067-001.

A76-40133 * Prebiotic peptide-formation in the solid state. III - Condensation reactions of glycine in solid state mixtures containing inorganic polyphosphates. H. Sawai and L. E. Orgel (Salk Institute for Biological Studies, San Diego, Calif.). *Journal of Molecular Evolution*, vol. 6, Nov. 4, 1975, p. 185-197. 12 refs. NASA-supported research; NSF Grant No. GP-38774X.

A76-40134 * The prebiotic synthesis of deoxythymidine oligonucleotides. II - Comparison of condensing agents. D. G. Odom and J. T. Brady (U.S. Army, Letterman Army Institute of Research, San Francisco, Calif.). *Journal of Molecular Evolution*, vol. 6, Nov. 4, 1975, p. 199-207. 21 refs. NASA-supported research.

A reaction which oligomerizes nucleotides under possible prebiotic conditions has been characterized. Nucleoside monophosphate in the presence of cyanamide at acid pH condenses to form dithymidine pyrophosphate and phosphodiester bonded compounds. Imidazole compounds and activated precursors such as nucleoside triphosphate are not necessary for this oligomerization reaction which produces primarily cyclic oligonucleotides. (Author)

A76-40135 * Compartmentalization of amino acids in surfactant aggregates - Partitioning between water and aqueous micellar sodium dodecanoate and between hexane and dodecylammonium propionate trapped water in hexane. J. H. Fendler, F. Nome, and J. Nagyvary (Texas A & M University, College Station, Tex.). *Journal of Molecular Evolution*, vol. 6, Nov. 4, 1975, p. 215-232. 29 refs. NASA-supported research.

The partitioning of amino acids (glycine, alanine, leucine, phenylalanine, histidine, aspartic acid, glutamic acid, lysine, iso-

leucine, threonine, serine, valine, proline, arginine) in aqueous and nonaqueous micellar systems was studied experimentally. Partitioning from neat hexane into dodecylammonium propionate trapped water in hexane was found to be dependent on both electrostatic and hydrophobic interactions, which implies that the interior of dodecylammonium propionate aggregates is negatively charged and is capable of hydrogen bonding in addition to providing a hydrophobic environment. Unitary free energies of transfer of amino acid side chains from hexane to water were determined and solubilities of amino acids in neat hexane substantiated the amino acid hydrophobicity scale. The relevance of the experiments to prebiotic chemistry was examined. B.J.

A76-40136* **Formation of nucleoside 5'-polyphosphates from nucleotides and trimetaphosphate.** R. Lohrmann (Salt Institute for Biological Studies, San Diego, Calif.). *Journal of Molecular Evolution*, vol. 6, Dec. 29, 1975, p. 237-252. 25 refs. NASA-supported research; Grant No. NIH-GM-13435.

Nucleoside 5'-polyphosphates (N5PP) formed when solutions of nucleoside 5'-phosphates (N5P) and trimetaphosphate (TMP) are desiccated at room temperature are studied by paper chromatography, electrophoresis, and metal catalytic reactions. Divalent Mg ion exhibited superior catalytic function to other divalent metal ions in the reaction. Major reaction products are indicated. The importance of the N5PP series, TMP, and N5-triphosphate as substrates of RNA and DNA synthesis, and under postulated prebiotic conditions likely to obtain during prebiological ages of the earth, is emphasized and discussed. Alternate drying and wetting, evaporation from a prebiotic puddle, concentration of solubles in the remaining liquid phase, metal catalysis, and the role of these substances in the formation of amino acids and long-chain polyphosphates are considered. R.D.V.

A76-40137 **On the possible role of organic melanoidin polymers as matrices for prebiotic activity.** A. Nissenbaum, D. H. Kenyon, and J. Oro. *Journal of Molecular Evolution*, vol. 6, Dec. 29, 1975, p. 253-270. 50 refs.

A prebiotic evolutionary scenario centered around insoluble melanoidin polymers (condensation products of amino acids and sugars) as loci, prebiotic matrix, or template for some protobiotic reactions, and as alternative loci to inorganic surfaces, is developed. The relation of melanoidins to humic and fulvic acids and kerogens is demonstrated, and a function of melanoidins as primeval external electron acceptors in the prebiotic soup is argued. The presence of heterocyclic nitrogen compounds similar to the nitrogenous bases, the high concentration of stable free radicals, concentration of heavy metals playing prominent roles in contemporary enzymic redox processes, diagenetic cleavage of part of the melanoidin polymer (in conversion of humic acid to kerogen) liberating moieties with limited enzyme-like activity into the soup and interaction of these moieties with coacervate-like microscopic particles reminiscent of the melanoidins are emphasized in support of the scenario. R.D.V.

A76-40138* **Aminoacyl transfer from an adenylate anhydride to polyribonucleotides.** A. L. Weber and J. C. Lacey, Jr. (Alabama, University, Birmingham, Ala.). *Journal of Molecular Evolution*, vol. 6, Dec. 29, 1975, p. 309-320. 22 refs. Grant No. NGR-01-010-001.

Imidazole catalysis of phenylalanyl transfer from phenylalanine adenylate to hydroxyl groups of homopolyribonucleotides is studied as a possible chemical model of biochemical aminoacylation of transfer RNA (tRNA). The effect of pH on imidazole-catalyzed transfer of phenylalanyl residues to poly(U) and poly(A) double helix strands, the number of peptide linkages and their lability to base and neutral hydroxylamine, and the nature of adenylate condensation products are investigated. The chemical model entertained exhibits a constraint by not acylating the hydroxyl groups of polyribonucleotides in a double helix. The constraint is consistent with selective biochemical aminoacylation at the tRNA terminus. Interest in imidazole as a model of histidine residue in protoenzymes

participating in prebiotic aminoacyl transfer to polyribonucleotides, and in rendering the tRNA a more efficient adaptor, is indicated.

R.D.V.

A76-40139* **Reactions of aminomalononitrile with electrophiles.** J. W. Thanassi (Salk Institute for Biological Studies, San Diego, Calif.). *Journal of Molecular Evolution*, vol. 7, Dec. 31, 1975, p. 65-73. 20 refs. Grant No. NSG-07021.

Aminomalononitrile (HCN trimer) reacts with electrophiles such as aldehydes and acrylonitrile under very mild conditions of temperature and pH to produce intermediates which, after acid hydrolysis, yield amino acids. The following amino acids have been identified and quantitated: glycine, D,L-erythro- and D,L-threo-beta-hydroxyaspartic acids, D,L glutamic acid, and D,L-threonine and allo-threonine. The mechanism of their formation and the possible significance of these reactions in prebiotic syntheses are discussed.

(Author)

A76-40195 **Simulation of the respiratory control system.** H. T. Milhorn, Jr. (Mississippi, University, Jackson, Miss.; East Tennessee State University, Johnson City, Tenn.). *Simulation*, vol. 27, Aug. 1976, p. 169-172. 31 refs.

The development of computer models of the mammalian respiratory system over the last two decades is reviewed. Models discussed include those for CO₂ inhalation, CO₂ and O₂ inhalation, perfusion of the cerebrospinal fluid and CO₂ inhalation, and CSF perfusion, CO₂ inhalation and O₂ inhalation. Also discussed are models for CO₂ inhalation, metabolic acidosis and metabolic alkalosis, Cheyne-Stokes respiration, phasic (breath-by-breath) air movement, and exercise. B.J.

A76-40198 **Renal handling of citrate during heat-induced hypocitricemia.** A. J. Gold and L. C. Costello (Howard University, Washington, D.C.). *American Journal of Physiology*, vol. 231, July 1976, p. 84-86. 18 refs. Research supported by the Andrew W. Mellon Foundation; Grant No. PHS-GM-17960.

A model of steady-state hypocitricemia, characterized by hypocitraturia and reduced kidney cortex citrate, has been demonstrated in the rat chronically exposed to environmental heat. The renal citrate extraction ratio remains unchanged. The physiological mechanism that brings about the reduction in circulating citrate has not been determined. Hypocitraturia likely results from a decreased filtered citrate load. Although it is generally contended that alkalosis increases and acidosis decreases renal excretion of citrate, observations of mild alkalosis and hypocitraturia during heat exposure suggest that factors other than pH can alter renal handling of citrate. Kidney mitochondrial function, as determined by in vitro measurements of citrate-stimulated respiratory rates and specific activities of isocitrate dehydrogenase, succinate dehydrogenase, malate dehydrogenase, and cytochrome c-oxidase, appears to be unaffected by environmental heat. (Author)

A76-40199 **Metabolic adaptations in brown adipose tissue of the hamster in extreme ambient temperatures.** T. Rabi and Y. Cassuto (Negev, University, Beersheba, Israel). *American Journal of Physiology*, vol. 231, July 1976, p. 153-160. 48 refs. Research supported by the University of Negev.

Experiments were conducted to evaluate the effect of cold and heat acclimation on the relative weight and composition of the brown adipose tissue (BAT) in adult male hamsters randomly divided into three groups maintained respectively for at least 21 days at 20 plus or minus 2 C, 5 plus or minus 1 C, and 35 plus or minus 1 C and then killed by decapitation and bled thoroughly. In cold acclimation, the relative weight of the BAT increased, its color grew dark, the multilocular structure was predominant, tissue protein content increased while fat content decreased, and the mitochondrial protein content increased. Opposite effects were observed in heat acclimation. In particular, cold acclimation was accompanied by increased tissue respiration in the presence of alpha glycerophosphate and succinate, whereas heat acclimation was found to reduce the respiratory activity of the tissue with these substrates. Differences in

the apparent activity of the mitochondria are suggested to be due to changes in mitochondrial conformation as a result of acclimation.

S.D.

A76-40200 **Hypothalamic and thalamic blood flow during somatic afferent stimulation in dogs.** P. Sandor, I. T. Demchenko, A. G. B. Kovach, and Y. E. Moskalenko (Semmelweis Orvostudományi Egyetem, Budapest, Hungary). *American Journal of Physiology*, vol. 31, July 1976, p. 270-274. 34 refs. Grant No. NIH-NS-10939-01.

An experimental study was carried out to assess the effect of nociceptive somatic C fiber stimulation on regional cerebral blood flow of the thalamic ventral-posterolateral nucleus and the hypothalamic ventromedial nucleus as well as tissue available oxygen aO₂ in anesthetized dogs at constant mean arterial blood pressure, P(CO₂), and pH. Sciatic nerves were prepared on both sides to stimulate somatic afferent C fibers. Changes in the regions studied were compared to those in the white matter. The results indicate that local peripheral resistance increased and local blood flow decreased in each area studied under the action of prolonged ipsilateral sciatic nerve stimulation. Blood flow decreased more in the thalamic than in the hypothalamic area, and the smallest changes were observed in the white matter. Contralateral stimulation of the sciatic nerves caused a more moderate but likewise marked drop in regional cerebral blood flow and an increase in cardiovascular resistance in the white matter. Tissue aO₂ in both areas decreased as compared to prestimulation level.

S.D.

A76-40224 # **Bioacoustics (Bioakustika).** V. D. Il'ichev, B. D. Vasil'ev, R. D. Zhantiev, V. R. Protasov, E. V. Romanenko, and G. N. Simkin. Moscow, Izdatel'stvo Vysshiaia Shkola, 1975. 256 p. 86 refs. In Russian.

A series of lectures on bioacoustics is presented. Individual papers discuss acoustical orientation in organisms of different degrees of evolutionary advancement: nonvertebrates, fish, reptiles and amphibians, birds, and mammals. Bioacoustical divergence and interspecific signalling are examined, together with biological sonar systems.

C.K.D.

A76-40344 # **Psychical disturbances in cases of burns caused by electric current (Psichicke poruchy po popaleni elektrickým proudem).** P. Pavlovsky (Psychiatrická Klinika, Prague, Czechoslovakia). *Energetika*, vol. 26, Apr. 1976, p. 160, 161. 5 refs. In Czech.

Frequent problems encountered in post-accident psychic morbidity are examined in relation to causes of contact with live current, somatic and psychic pathological reactions of electric shock victims with extensive burns, and psychic morbidity during physical recovery. Four phases of the organism's reaction are delineated (initial shock; post-shock euphoria; severe depression and psychic complications aggravated by swamping of the organism by toxic substances due to tissue necrosis, loss of liquids, metabolic/circulatory/neurohumoral disorders; reconvalescence and attendant psychic stresses). Problems of reconvalescence affected by amputations, severe cosmetic alterations, impaired motions, work injuries, or social isolation are considered. Injuries to brain tissue and electroencephalopathies, are also discussed, in addition to on-the-job safety.

R.D.V.

A76-40345 # **Hearing protectors for workers in energy plants (Ochrana sluchove pomucky v energetických provozech).** V. Kambersky (Energoinvest, Prague, Czechoslovakia). *Energetika*, vol. 26, Apr. 1976, p. 169-172. In Czech.

Noise levels around different types of industrial machinery are listed in line with the 1967 Ministry of Public Health standard on noise levels and noise abatement. Varieties of on-the-job hearing protection devices are described and noise attenuation graphs are displayed for the main types. The discussion covers: devices plugging the auditory passages (glass cloth and plastic ear protectors, resonant ear protectors), noise-silencing ear muffs with different types of padding and clamping, antinoise hoods and helmets. The antinoise helmets and hoods, and some protectors in use in East Germany, provide 30-40 dB attenuation above 4000 Hz.

R.D.V.

A76-40460 # **Application of statistical modeling to the investigation of the activity of the operator in man-machine automatic control system complexes (K voprosu issledovaniia deiatel'nosti operatora v cheloveko-mashinnykh kompleksakh ASU s primeneniem metoda statisticheskogo modelirovaniia).** Zh. K. Chuvakov. *Teoriia Kodirovaniia i Informatsionnoe Modelirovanie*, no. 2, 1975, p. 192-196. 8 refs. In Russian.

A76-40575 # **Effects of exercise-induced stress on platelet aggregation.** R. Levites (U.S. Veterans Administration Hospital, Bronx, N.Y.) and J. I. Haft (Mount Sinai School of Medicine, New York, N.Y.). *Cardiology*, vol. 60, no. 5, 1976, p. 304-314. 26 refs.

Platelet aggregation studies were conducted before and after a double two-step Master test in 19 patients with predominant angina pectoris aged 35-60 yr and in 19 normal controls aged 25-65 yr. The response of platelet-rich plasma to 0.1, 1, and 10 micro-M of ADP and 1 and 10 micro-M of epinephrine was tested in a chrono-log aggregometer. No significant differences in the number of biphasic responses (irreversible aggregation) to the several concentrations of aggregating agents were observed at rest between the two groups. Following exercise, differences between the two groups became apparent. While among controls the number of biphasic responses before and after exercise remained essentially unchanged, the number of biphasic responses in patients with coronary artery disease increased markedly after exercise, with statistically significant difference between the two samples. It is concluded that exercise increases significantly the tendency of platelets to aggregate among patients with coronary artery disease, probably related to myocardial infarction during stress.

S.D.

A76-40627 **Control and modeling of physiological processes (Upravlenie fiziologicheskimi protsessami i ikh modelirovanie).** Edited by V. N. Chernigovskii. Moscow, Izdatel'stvo Nauka (Problemy Kosmicheskoi Biologii. Volume 31), 1975. 312 p. In Russian.

The present collection of papers is concerned with such key problems of space biology as modeling of the vestibular system and control of locomotions, regulation of blood circulation, modeling of alveolar gas exchange, and biophysics of photosynthesis. Physico-mathematical approaches are used to solve biological problems in conjunction with experimental physiological and biophysical investigations of processes taking place in humans and animals as well as in isolated biological objects. Featured topics include physical modeling of the system of semicircular canals in man, characteristics of muscle control during stabilization and rhythmic activity, investigation of cerebrospinal reflexes, and quantum electronic approach to study the initial stage of photosynthesis.

S.D.

A76-40628 # **Response of the hydrodynamically interacting semicircular canals to an adequate stimulus (Reaktsiia gidrodinamicheskii vzaimodeistvuiushchikh polukruzhnykh kanalov na adekvatnyi razdrzhitel').** I. Iu. Sarkisov (Moskovskii Fiziko-Tekhnicheskii Institut, Moscow, USSR). In: Control and modeling of physiological processes. Moscow, Izdatel'stvo Nauka, 1975, p. 7-14. 14 refs. In Russian.

Requirements of modern air and space flights has made it necessary to study the vestibular responses caused by the action of different angular velocities on the semicircular canals. The paper describes a mathematical model for the system of hydrodynamically interacting semicircular canals in the human ear, with particular reference to the response of this system to an adequate stimulus. The model proposed by Steinhausen (1933) - which reflects the processes taking place in an isolated canal - is only applicable in a first approximation to describe the entire response of the system of three semicircular canals in a natural labyrinth. The discussion is limited to the left complex of semicircular canals. A matrix of interaction coefficients is derived which shows that the effect of the flows of the endolymph in the vertical canals on the deviation of the cupula of the horizontal canal is either absent or negligible.

S.D.

A76-40629 # Results of physical modeling of the system of semicircular canals in man - Functioning of the vestibular apparatus during oscillations of the head (Rezultaty fizicheskogo modelirovaniia sistemy polukruzhnykh kanalov cheloveka - Funktsionirovanie vestibuliarnogo apparata pri osttsiliatsiakh golovy). S. V. Petukhov (Gosudarstvennyi Nauchno-Issledovatel'skii Institut Mashinovedeniia, Moscow, USSR). In: Control and modeling of physiological processes. Moscow, Izdatel'stvo Nauka, 1975, p. 14-64. 79 refs. In Russian.

The paper is concerned with advances in obtaining exact information about the dynamics of labyrinth processes in the vestibular system and in establishing correlations between these processes and vestibular reactions of the human body. These advances are achieved by creating a scale model of the system of semicircular canals which is capable of reproducing the dynamics of natural labyrinth processes in suitable conditions of physical experimentation. The development of such scale models is based on likelihood criteria for the processes in the vestibular labyrinth, which are derived on the basis of the theory of dynamic likelihood. Necessary information on the structure of the semicircular canals and well-known attempts at their physical modeling are reviewed. Results are presented for model experiments in the study of the dynamics of the motion of the cupulae of semicircular canals for certain types of rotation of the head. S.D.

A76-40630 # Moments at joints during human walking and the problem of maintaining equilibrium (O sustavnykh momentakh pri khod'be cheloveka i zadache podderzhaniiia ravnovesiia). T. I. Shtil'kind (Moskovskii Fiziko-Tekhnicheskii Institut, Moscow, USSR). In: Control and modeling of physiological processes. Moscow, Izdatel'stvo Nauka, 1975, p. 64-119. 18 refs. In Russian.

The paper outlines a model for computer-aided calculation of the moments of internal forces acting at the joints in human legs during walking and a model for maintaining equilibrium and controlling human motion. The model describing the plane motion of legs during locomotion makes it possible to determine, by solving a pertinent inverse problem of mechanics, the moments at the leg joints irrespective of the body kinematics. The stabilization of the equilibrium model in the case of delay in the feedback loop is discussed. S.D.

A76-40631 # Investigation of the characteristics of muscle control during stabilization and rhythmic activity (Issledovanie osobennostei upravleniia myshtsami v rezhime stabilizatsii i ritmicheskoi aktivatsii). T. B. Kireeva (Moskovskii Fiziko-Tekhnicheskii Institut, Moscow, USSR). In: Control and modeling of physiological processes. Moscow, Izdatel'stvo Nauka, 1975, p. 119-134. 6 refs. In Russian.

Electromyographic experiments were conducted on seven healthy subjects and six patients with Parkinson's disease to elucidate differences and general trends in the organization of the control of rhythmic movements and stabilization of exerted force. Attention is focused on the investigation of the effect of variation in afference on both regimes of muscular activity. It is shown that a change in afference has a strong effect on static muscular activity, whereas rhythmic activity is far less sensitive to change in afference. External forces have an almost identical effect on static or rhythmic muscular activity both during voluntary activation in the healthy subjects and during involuntary activation in the patients considered. S.D.

A76-40632 # Investigation of cerebrosplinal reflexes - A review of the concept of bulbar vasomotor center (Issledovanie spinnomozgovykh vazomotornykh reflektsov - K kritike kontseptsii bul'barno sosudodvigatel'nogo tsentra). E. V. Lukoshkova (Akademiia Meditsinskikh Nauk SSSR, Moscow, USSR). In: Control and modeling of physiological processes. Moscow, Izdatel'stvo Nauka, 1975, p. 135-157. 64 refs. In Russian.

Electrophysiological experiments were conducted on anesthetized cats under conditions of artificial breathing in order to determine the level of switching the impulses of afferent fibers of

cerebrosplinal nerves to preganglionic neurons involved in the sympathetic innervation of the heart and vessels. The discussion covers the reflex responses of the cardiovascular system and bioelectrical activity of sympathetic nerves; identification of the afferent fibers of spinal nerves, which elicit, in the animals with intact brain, vasomotor reflexes and responses in sympathetic nerves; spinal closing of the arcs of vasomotor reflexes relative to reflexes induced by stimulation of mesenteric and somatic nerves; and possible causes of attenuation and fadeout of reflex responses in spinal specimens. Some functions of the bulbar vasomotor center are discussed. S.D.

A76-40633 # Investigation of causes of orthostatic instability (Izuchenie prichin ortostaticheskoi neustoiichivosti). L. L. Shik, K. A. Sergeeva, and V. A. Moiseev (Akademiia Meditsinskikh Nauk SSSR, Moscow, USSR). In: Control and modeling of physiological processes. Moscow, Izdatel'stvo Nauka, 1975, p. 157-164. 9 refs. In Russian.

Results are presented for experiments on healthy subjects and patients with primary and secondary varicose dilatation, subjected to a modified orthostatic test, in order to assess the significance of impairment in the capacity and stiffness of the veins in the lower limbs, efficiency loss in the mechanism of limiting the arterial inflow due to constriction of resistive vessels, noncontraction of skeletal muscles of the limbs, and disorders in vasomotor regulation. Patients with damaged spinal cord were also tested. Both groups of patients with varicose dilatation exhibited loss of muscular tonus in the lower limbs as well as their paralysis. Decrease of vasomotor regulation and not of motor innervation of skeletal muscles is the dominant factor accounting for sharp disorders in orthostatic stability. Efficiency loss in constrictional responses of resistive vessels of the lower limbs appears to be less significant. Paralysis of the skeletal muscles of the lower limbs is not a decisive factor in sharp disorders of orthostatic stability occurring during damages to the spinal cord. S.D.

A76-40634 # Investigation of the mechanical parameters of fine blood vessels (Issledovanie mekhanicheskikh parametrov melkikh krovenosnykh sosudov). A. N. Rogozha (Akademiia Meditsinskikh Nauk SSSR, Moscow, USSR). In: Control and modeling of physiological processes. Moscow, Izdatel'stvo Nauka, 1975, p. 165-176. 27 refs. In Russian.

Prolonged hypotony due to weightlessness may result in serious changes in the state of the vascular bed in man. A resistographic technique is proposed for analyzing the mechanics of fine arteries with diameter less than 1 mm. A test facility is designed which permits maintaining for several hours the working capacity of an isolated artery and carrying out its chemical or electrical stimulation, recording the behavior of the hydraulic conductivity of a vessel, and measuring the outer radius and length of a vessel under stationary conditions (3% accuracy). A preliminary analysis of results reveals that the method of resistography is suitable for analyzing vessel wall elasticity and that the mechanical parameters thus determined agree reasonably well with data obtained by other workers. S.D.

A76-40635 # Role of diffusion in intrapulmonary mixing of gases (Rol' diffuzii vo vnutrilegochnom smeshenii gazov). L. A. Sidorenko and L. L. Shik (Moskovskii Fiziko-Tekhnicheskii Institut, Moscow, USSR). In: Control and modeling of physiological processes. Moscow, Izdatel'stvo Nauka, 1975, p. 177-190. 20 refs. In Russian.

There is enough evidence to complement the classical concepts on the mechanism of pulmonary ventilation with the decisive role of intrapulmonary diffusion in the passage of atmospheric air to the remote regions of the tracheobronchial tree and alveoli. Proofs pertaining to the role of intrapulmonary mixing of gases are discussed in terms of morphological data, model concepts, and experimental findings. The classical concepts are found to be insufficient as they claim that the only reason of alveolar ventilation is the flow of inspired air produced by the physical work of respiratory muscles. There is no doubt that the propagation of

inspired air to the end sections of the bronchial tree and directly to the alveoli takes place through diffusion. The dead space may be regarded as consisting of the anatomical dead space and of an additional component resulting from layered inhomogeneities in the pulmonary system. S.D.

A76-40636 # Effect of pressure and composition of gaseous medium on PO₂ and pCO₂ gradients between mixed alveolar air and arterial blood (Vliianie davleniia i sostava gazovoi sredy na gradienty pO₂ i pCO₂ mezhdru smeshannym al'veoliarnym vozdukhom i arterial'noi krov'iu). V. P. Nikolaev and V. G. Shabel'nikov (Moskovskii Fiziko-Tekhnicheskii Institut, Moscow, USSR). In: Control and modeling of physiological processes. Moscow, Izdatel'stvo Nauka, 1975, p. 191-216. 40 refs. In Russian.

The paper is concerned with the theoretical analysis of the mechanisms underlying the influence of pressure and composition of a gaseous medium on the process of O₂ and CO₂ transport between the lungs and blood. Particular attention is devoted to the mathematical model of gas exchange between the lungs and blood and to the losses in O₂ and CO₂ tensions during the diffusion of these gases in the alveolar space of the lungs. The alveolo-arterial difference pO₂ and the arterio-alveolar difference pCO₂ are presented as the sum of five different components. Such an approach permits solution of a wide variety of problems in respiratory physiology and, in particular, differentiation of the effect of physiological and physical factors on the transport of gases between the lungs and blood. Illustrative examples are provided. S.D.

A76-40637 # Role of the alveolar ventilation/perfusion line in a periodically ventilated lung model (Rol' linii dV sub A/dt/dQ/dt' v periodicheskii ventiliruemoi modeli legkikh). V. G. Shabel'nikov (Moskovskii Fiziko-Tekhnicheskii Institut, Moscow, USSR). In: Control and modeling of physiological processes. Moscow, Izdatel'stvo Nauka, 1975, p. 216-234. 20 refs. In Russian.

The paper presents a qualitative analysis of a mathematical model for gas exchange in the lungs ventilated by periodical changes of their volume. The analysis made it possible to obtain a more precise definition of the degree of applicability of the concepts of ideal alveolar gas and line of alveolar ventilation/perfusion relationships for describing the transport of gases in real lungs. It is shown that the alveolar point which reflects the composition of air in a lung unit moves always to its state of stable equilibrium. The continuously ventilated lung model demonstrates the particular case or alveolar-point trajectories - i.e., the equilibrium state in the inhaling phase. S.D.

A76-40638 # Quantum electronic approach to study the initial stage of photosynthesis (Kvantovoelektronnyi podkhod k izucheniiu pervichnoi stadii fotosinteza). E. M. Trukhan (Moskovskii Fiziko-Tekhnicheskii Institut, Moscow, USSR). In: Control and modeling of physiological processes. Moscow, Izdatel'stvo Nauka, 1975, p. 235-256. 36 refs. In Russian.

The characteristics of the light-induced stage of photosynthesis of leaves and algae are analyzed in the light of solid state physics. Requirements to be met by a quantum electronic model for the initial stage of photosynthesis are formulated. Properties of p-n transition are theoretically examined as a basis for a possible model of generation of reduction potential in a natural and artificial photosynthetic system. It is shown that a simple electron-hole transition can hardly be used as a model for a natural system. Perspective of studying a model with the cooperation of excitation quanta is noted. S.D.

A76-40639 # Experimental investigation of the physical characteristics of the initial stage of photosynthesis (Eksperimental'noe issledovanie fizicheskikh kharakteristik pervichnoi stadii fotosinteza). E. M. Trukhan, V. N. Deriabkin, and V. B. Kireev (Moskovskii Fiziko-Tekhnicheskii Institut, Moscow, USSR). In: Control and modeling of physiological processes. Moscow, Izdatel'stvo Nauka, 1975, p. 256-272. 31 refs. In Russian.

There is presently no common agreement about the physical mechanism responsible for the conversion of luminous energy into chemical potential representing the prime mover of CO₂ reduction in photosynthesis of plants. The paper is concerned with an experimental study of the luminescence, photoconductivity, and rate of oxygen release upon exposure of certain plant leaves to light. A brief description is given of the measuring facilities used. Experimental results are compared with available published data on the extent of photosynthetic action on the biomass of plants. S.D.

A76-40640 # A cooperative model for the first stage of photosynthesis (Ob odnoi kooperativnoi modeli pervichnoi stadii fotosinteza). E. M. Trukhan and V. B. Kireev (Moskovskii Fiziko-Tekhnicheskii Institut, Moscow, USSR). In: Control and modeling of physiological processes. Moscow, Izdatel'stvo Nauka, 1975, p. 273-293. 21 refs. In Russian.

The paper analyzes the cooperation of light quanta through an intermediate excited level of energy for the development of a possible model for a photosynthetic system. Attention is focused on the possibilities of the cooperation of quantum energy for constructing the theoretical model of the initial stage of photosynthesis in higher plants and green algae. Basic experimental properties of photosynthesizing systems are formulated. The proposed theoretical model for the cooperation of excitation quanta in the luminous stage of photosynthesis is based on second excited state. A mathematical analysis shows that the model meets the formulated experimental requirements. S.D.

A76-40641 # Kinetics of oxygen release from single-cell algae (Kinetika vydeleniia kisloroda odnokletocnymi vodorosliami). A. N. Asanov (Moskovskii Fiziko-Tekhnicheskii Institut, Moscow, USSR). In: Control and modeling of physiological processes. Moscow, Izdatel'stvo Nauka, 1975, p. 293-310. 29 refs. In Russian.

Photosynthesis in plants is discussed in terms of photo-oxidation, photoreduction, and photophosphorylation. The rate of oxygen release reflects the course of the whole luminous stage of photosynthesis. The rate of oxygen release in *Chlorella pyrenoidosa*, *Anacystis*, and *Kirchneriella obesa* is studied experimentally by the method of modulated amperometry. The kinetics of oxygen release after the period of darkness is discussed along with a model for a photosynthetic unit where the semiconducting properties of chlorophyll play a key role in photosynthesis. S.D.

A76-40712 Interactive graphics in the analysis of neuronal spike train data. R. J. Scabassi, R. Buchness, and T. Estrin (California, University, Los Angeles, Calif.). *Computers in Biology and Medicine*, vol. 6, July 1976, p. 163-178. 22 refs. Grants No. PHS-NS-02501; No. NIH-FR-3.

The paper outlines an interactive graphics system used in the modeling and analysis of neuronal spike-train data recorded from single nerve cells. In particular, the application of a multiprocessor graphics system to one formulation of the microscopic identification problem in neurophysiology is discussed. The observed experimental spike-train data are characterized as a stochastic point process, and the analytical techniques available to investigate the dependency structure of the data are reviewed. The graphics system developed for this study employs three separate computers, allowing for efficient distribution of tasks between elements in the multiprocessor network. The interactive graphics program is structured as a resident executive with a number of phases available for overlay at execution. The major phases include data base generation, modeling, optimization, data processing, and validation. The implications of the use of interactive graphics in support of studies of this type are discussed. S.D.

A76-40713 Digital archiving of biomedical recordings for off-line computer analysis. W. K. Harrison and K. M. Bakalar (Johns Hopkins University, Baltimore, Md.). *Computers in Biology and Medicine*, vol. 6, July 1976, p. 191-198. Grants No. NIH-HL-14928; No. NIH-HL-16907.

This article describes a new procedure for archiving biomedical recordings on industry standard digital magnetic tape. Familiar computer methodology is employed for data-banking heartbeat patterns in a format which has been optimized for later analysis. Recordings are made through an encoder-controller unit coupled to a four channel FM cassette data recorder. This unit produces FM analog magnetic tape with square wave identification and calibration code preceding each sample of biomedical data. Code bits and data sample are timed out sequentially in repetitive standardized format. Digital images of these specially formatted analog tape cassettes are then processed by an edit program on an IBM 370/145. Here, the identifiers are decoded and data sections located. Identification, calibration, and biomedical recordings are then archived on a directory tape which may be efficiently and repeatedly accessed for future computations. (Author)

A76-40752 **Electromagnetic field effects in nerve tissue.** S. S. Sandler (Northeastern University, Boston, Mass.) and G. S. Smith (Harvard University, Cambridge, Mass.). In: *Electromagnetic compatibility; Proceedings of the First Symposium and Technical Exhibition*, Montreux, Switzerland, May 20-22, 1975.

New York, Institute of Electrical and Electronics Engineers, Inc., 1975, p. 393-395. NSF Grant No. GK-40575.

In the present work an attempt has been made to correlate structural alterations in tissue from the nervous system of leopard frogs with the specific local electric field intensity in the tissue. The local field used for the exposures was composed of a train of high intensity sub-nanosecond pulses with a low repetition rate. These pulses provide a high electric field intensity in the tissue yet a low enough absorbed energy to cause negligible thermal heating. A special coaxial exposure chamber was used to hold tissue removed from the freshly killed frogs while it was exposed to the pulsed field. The coaxial geometry permits accurate determination of the local electric field in the tissue. The exposed tissue and control tissue from the same animal were simultaneously prepared for microscopic investigation. (Author)

A76-40757 **Electromagnetic compatibility /EMC/ as a determining factor in biological effects caused by electric and magnetic fields.** W. E. Cory (Southwest Research Institute, San Antonio, Tex.) and C. L. Frederick. In: *Electromagnetic compatibility; Proceedings of the First Symposium and Technical Exhibition*, Montreux, Switzerland, May 20-22, 1975.

New York, Institute of Electrical and Electronics Engineers, Inc., 1975, p. 469-474. 15 refs.

This paper defines the state of electromagnetic compatibility in terms of the electrical intrinsic impedance of the whole body and its systems and organs, for example, the peripheral nervous system, blood, brain, thyroid, thymus, hypothalamus, adrenal glands, pituitary gland, and reproductive organs. Included is a discussion of the experimental and theoretical basis for certain observed biological effects in terms of the state of electromagnetic compatibility between the exposed organism and the electrical field existing in the environment. (Author)

A76-40885 * **Nocturnal lowering of thresholds for sweating and vasodilation.** C. B. Wenger, M. F. Roberts, J. A. J. Stolwijk, and E. R. Nadel (Yale University, New Haven, Conn.). *Journal of Applied Physiology*, vol. 41, July 1976, p. 15-19. 26 refs. Grants No. NIH-ES-00123; No. NIH-ES-00354; No. NSG-9023.

The effect of the time of day on the relation of the heat-dissipating responses (sweating and vasodilation) to esophageal and mean skin temperatures was investigated. These parameters were measured in six subjects exercised at 60-70% of maximal aerobic power in a 25 deg C ambient. Results indicate that a circadian rhythm in the thresholds for sweating and vasodilation can account for much of the rhythm of internal body temperature. The circadian rhythm in the operation of the thermoregulatory system seems to be expressed through a reference point shared by vasomotor and sudomotor controls. C.K.D.

A76-40886 **Plasma renin, angiotensin II, and plasma and urinary aldosterone in running exercise.** K. J. Kosunen (Helsinki, University, Helsinki, Finland) and A. J. Pakarinen (Meilahti Hospital, Helsinki, Finland). *Journal of Applied Physiology*, vol. 41, July 1976, p. 26-29. 21 refs. Research supported by the Ministry of Education of Finland.

A76-40887 **Systolic time intervals during +Gz acceleration.** T. B. Graboys and E. D. Michaelson (USAF, School of Aerospace Medicine, Brooks AFB, Tex.). *Journal of Applied Physiology*, vol. 41, July 1976, p. 52-56. 18 refs.

The feasibility of using systolic time intervals (STI) as a noninvasive means of studying cardiac function during positive vertical acceleration was investigated. The STI of subjects was monitored before, during, and after 30-sec exposures to +3, +5, and +7 G. Prolongation of the heart rate (HR) corrected electro-mechanical systole interval, left ventricular ejection time (LVET), pre-ejection period and PEP/LVET was observed within the first five seconds of exposure to positive acceleration. The effects of positive acceleration on stroke volume and cardiac output were estimated using previously reported relationships between invasively determined parameters and STI. Although STI can be successfully measured at high positive G, it is concluded that extrapolation of these measurements to invasively derived parameters of left ventricular function should be viewed cautiously. C.K.D.

A76-40888 **Threshold temperatures for shivering in acute and chronic hypercapnia.** K. E. Schaefer and W. Wünnenberg (Yale University, New Haven, Conn.). *Journal of Applied Physiology*, vol. 41, July 1976, p. 67-70. 9 refs.

A76-40889 **Effect of angiotensin on hypoxic pulmonary vasoconstriction in isolated dog lung.** J. M. Alexander, M. D. Nyby, and K. A. Jasberg (California, University, Los Angeles; U.S. Veterans Administration Hospital, Sepulveda, Calif.). *Journal of Applied Physiology*, vol. 41, July 1976, p. 84-88. 29 refs.

A76-40890 **Alkaline shift in lumbar and intracranial CSF in man after 5 days at high altitude.** R. B. Weiskopf (U.S. Army, Research Institute of Environmental Medicine, Natick, Mass.), R. A. Gabel (Peter Bent Brigham Hospital, Boston, Mass.), and V. Fencel (Harvard University, Boston, Mass.). *Journal of Applied Physiology*, vol. 41, July 1976, p. 93-97. 22 refs.

A76-40891 **A new method to determine frequency characteristics of the respiratory system.** F. J. Landser, J. Nagels, M. Demedts, L. Billiet, and K. P. van de Woestijne (Academisch Ziekenhuis, Leuven, Belgium). *Journal of Applied Physiology*, vol. 41, July 1976, p. 101-106. 10 refs.

A technique is described allowing one to determine simultaneously the resistance and reactance of the total respiratory system for various frequencies. During spontaneous breathing, regularly recurring impulses are produced at the mouth by means of a loudspeaker. A Fourier analysis of the mouth pressure and flow signals yields mean resistance and reactance values, over 16 s, for all harmonics of 2 Hz up to 30 Hz. The values are in good agreement with those obtained in the absence of breathing and those determined by means of the forced oscillation technique and by body plethysmography. The reproducibility of the measurements is satisfactory (coefficient of variation: 11.6%). (Author)

A76-40892 * **Implantable electrode for recording nerve signals in awake animals.** I. Ninomiya (Hiroshima University, Hiroshima, Japan), Y. Yonezawa (Hiroshima Institute of Technology, Hiroshima, Japan), and M. F. Wilson (West Virginia University, Medical Center, Morgantown, W. Va.). *Journal of Applied Physiology*, vol. 41, July 1976, p. 111-114. 7 refs. Ministry of Education of Japan Grant No. 021514; Grant No. NGR-49-001-048.

An implantable electrode assembly consisting of collagen and metallic electrodes was constructed to measure simultaneously neural signals from the intact nerve and bioelectrical noises in awake animals. Mechanical artifacts, due to bodily movement, were negligibly small. The impedance of the collagen electrodes, measured in awake cats 6-7 days after implantation surgery, ranged from 39.8-11.5 k ohms at a frequency range of 20-5 kHz. Aortic nerve activity and renal nerve activity, measured in awake conditions using the collagen electrode, showed grouped activity synchronous with the cardiac cycle. Results indicate that most of the renal nerve activity was from postganglionic sympathetic fibers and was inhibited by the baroreceptor reflex in the same cardiac cycle. (Author)

A76-40947 * Tissue catecholamine levels of the golden hamster *Mesocricetus auratus* acclimated to 7, 22 and 34 C. S. B. Jones and X. J. Musacchia (Missouri, University, Columbia, Mo.). *Comparative Biochemistry and Physiology*, vol. 52C, 1975, p. 91-94. 22 refs. Research supported by the University of Missouri; Grant No. NGR-26-004-021.

A76-40985 # Life and the outer planets. I - Performance of terrestrial organisms in ammonia-rich systems. S. M. Siegel (Hawaii, University, Honolulu, Hawaii). *COSPAR, Plenary Meeting, 19th, Philadelphia, Pa., June 8-19, 1976, Paper*. 9 p. 15 refs.

Survival and growth of organisms has been demonstrated at 298 K in NH₃ atmospheres, including NH₃-CH₄ mixtures. Included are bacteria (*Clostridium* and *Pseudomonas*) and fungi (*Penicillium* and *Torula*). A distinctive discovery of possible pre-Cambrian affinities, *Kakabekia barghoorniana*, developed in NH₃-saturated aqueous media at 267 K. Although in *Allium* species the biological response is limited to germination, standard metabolic poisons were active even in 15 M aqueous NH₃ at 250 K. The most extreme example of compatibility between NH₃-rich environments and terrestrial life was the retention of metabolic capabilities by conidia of *Penicillium* after 6 months at 233 K in a liquid ammonia-glycerol medium. Tritiated thymidine, uridine and amino acids were incorporated by these conidia unless subjected to intense gamma-radiation. Observations suggest that the analogies between H₂O and NH₃ as solvent media or -OH and -NH₂ as functional groups are probably valid, and that chemical-biological evolution not unlike the early terrestrial could be compatible with chemical conditions presumed to exist on the outer planets and some of their satellites. (Author)

A76-40986 # Life and the outer planets. II - Enzyme activity in ammonia-water systems and other exotic media at various temperatures. S. M. Siegel and T. Speitel (Hawaii, University, Honolulu, Hawaii). *COSPAR, Plenary Meeting, 19th, Philadelphia, Pa., June 8-19, 1976, Paper*. 10 p. 12 refs.

Enzyme activities are customarily measured in aqueous solutions. Activity and thermodynamic parameters are based upon behavior in these solutions, although they in no way represent the highly structured internal surface system of the cell. It would, therefore, not be surprising if the actual environmental limits for enzyme action were in some cases greater than those generally assumed. Several enzymes retain activity in drastically modified aqueous and nonaqueous media, including aprotic solvents. Examples include formic acid, methanol, formamide, nitromethane, 10 molal LiCl and 15 molar aqueous ammonia. Temperatures as low as 225-233 K permit activity in some media. Included are peroxidase, catalase, urease, and amylase. Ammonia-rich environments are compatible with some forms of terrestrial life, but the demonstration of biocatalyst activity in these exotic media and conditions is relevant to chemical evolution on Jupiter and similar planetary systems. (Author)

A76-41120 * Amino acid precursors in lunar fines - Limits to the contribution of jet exhaust. S. W. Fox, K. Harada (Miami, University, Coral Gables, Fla.), and P. E. Hare (Carnegie Institution of Washington, Washington, D.C.). *Geochimica et Cosmochimica Acta*, vol. 40, Sept. 1976, p. 1069-1071. 25 refs. Grant No. NGR-10-007-088.

A sample of lunar fines collected at a maximum distance, 6.5 km, from the descent engine on Apollo 17 has been analyzed for total amino acids obtainable by hydrolysis of aqueous extracts. The minimum amounts of amino acids, calculated for a disk of 6 km radius are 10,000 to 100,000 times those which could be contributed by the lunar module jet exhaust, on the basis of conservatively limiting assumptions. The amino acids thus obtained are not explainable as due to chemical or biological contamination; their source is accordingly inferred as lunar. Under the conditions of hydrolysis of lunar extracts, cyanide is found to be converted, almost exclusively to glycine, to an extent of 0.0001. (Author)

A76-41124 Avoidance of radiation hazards from microwave antennas. D. H. Shinn. *Marconi Review*, vol. 39, 2nd Quarter, 1976, p. 61-80. 9 refs.

Powerful microwave radiation can initiate fires and explosions and may also be harmful to biological systems. Consequently, near some microwave antennas there may be regions which are hazardous for people, refuelling and so on. Precautions are always to be taken to prevent access or refuelling in these regions while the hazardous power level is present. A graphical method is presented for determining the boundaries of these hazardous regions, given the peak power and mean power radiated, and the size and gain of the antenna. As examples, a tropospheric scatter communications installation and a radar height finder are treated in detail; and it is indicated how such hazards can be avoided. (Author)

A76-41142 * Observations on autoregulation in skeletal muscle - The effects of arterial hypoxia. G. M. Pohost, J. B. Newell, N. P. Hamlin, and W. J. Powell, Jr. (Massachusetts General Hospital; Harvard University, Boston, Mass.). *Cardiovascular Research*, vol. 10, July 1976, p. 405-412. 13 refs. NASA-supported research; Grant No. NIH-HL-06665.

An experimental study was carried out on 25 mongrel dogs of both sexes to re-evaluate autoregulation of blood flow in skeletal muscle, with particular reference to the steady-state resistance and transient response in muscle blood flow following a square wave increase in arterial perfusion pressure and to the examination of the effect of arterial hypoxia on this transient response. The data emphasize the importance of considering the transient changes in blood flow in evaluating the autoregulatory response in skeletal muscle. For quantification purposes, a parameter termed alpha is introduced which represents the ratio between the increase in blood flow from baseline to peak and the return of blood flow from the peak to the new steady-state. Such a quantification of the transient response in flow with step increases in perfusion pressure demonstrates substantial transient responses under conditions of normal oxygenation and progressive attenuation of flow transients with increasing hypoxia. S.D.

A76-41143 Simultaneous measurement of cardiac output and its distribution with microspheres in the rat. D. G. McDevitt (Vanderbilt University, Nashville, Tenn.) and A. S. Nies. *Cardiovascular Research*, vol. 10, July 1976, p. 494-498. 18 refs. Grant No. PHS-GM-15431.

A76-41201 Effects of electrical stimulation in the lower brainstem on temperature regulation in the unanaesthetized guinea-pig. Z. Szelenyi, E. Zeisberger, and K. Brück (Giessen, Universität, Giessen, West Germany). *Pflügers Archiv*, vol. 364, no. 2, 1976, p. 123-127. 23 refs. Deutsche Forschungsgemeinschaft Grant No. SFB-122.

A76-41202 Responses of midbrain raphe neurons to local temperature. T. Hori and Y. Harada (Kumamoto University, Kumamoto, Japan). *Pflügers Archiv*, vol. 364, no. 2, 1976, p. 205-207. 15 refs.

The effect of heating and cooling in the midbrain on the unit activities of midbrain raphe neurons in the rat was observed. Out of 24 raphe units studied, 14 units responded to a rise in midbrain

temperature with an increased rate of firing. The remaining 10 units did not respond to temperature changes between 34 and 41 C. The result is consistent with the idea that the heat-induced increase in brain serotonin turnover is mediated by an increased firing rate of midbrain raphe neurons. (Author)

A76-41321 **Motion information in iconic memory.** P. Demkiw and C. F. Michaels (Lake Forest College, Lake Forest, Ill.). *Acta Psychologica*, vol. 40, Aug. 1976, p. 257-264. 10 refs.

Motion perception was investigated in two experiments using Sperling's partial report procedure. In Experiment 1, subjects were presented with 8 moving squares; at array offset an arrow cued subjects to locate all squares moving in the direction of the arrow. The partial report was found to be superior to the whole report and this was taken as evidence for the existence, in iconic memory, of information about the direction of motion. The second experiment revealed only a minor decay in this superiority with the indicator delayed up to 1 sec. The importance of optical transformations in vision was stressed and it was argued that information processing models need pay greater attention to them. (Author)

A76-41322 **Effect of information feedback upon intertrial consistency of time judgment.** R. E. Hicks (New York, State University, Albany, N.Y.). *Acta Psychologica*, vol. 40, Aug. 1976, p. 265-270. 14 refs.

Groups of subjects making verbal estimations of time intervals without information feedback (IF) about errors produced an intertrial correlation matrix with a well defined superdiagonal form, while those with IF did not. IF appeared to affect the subjects' response criteria rather than their sensitivity to stimulation, and the behavior of these subjects can be interpreted within the context of either the complication or the simplification hypothesis (Jones, 1969). However, neither of these hypotheses satisfactorily accounts for the progressive underestimation of time intervals by subjects without IF, and it is suggested that an interpretation based on changing processes underlying judgments is more appropriate for this group. C.K.D.

A76-41323 **Elimination by aspects as a decision rule for risky choice.** R. H. Ranyard (Bolton Institute of Technology, Bolton, Lancs., England). *Acta Psychologica*, vol. 40, Aug. 1976, p. 299-310. 16 refs.

The elimination by aspects model (Restle, 1961; Tversky, 1972), in which choice alternatives are represented as collections of valued aspects, was tested in risky choice trials consisting of duplex gambles in which valued aspects were assumed to be explicit probabilities and payoffs. Substantial violations of two of the three consequences of the elimination by aspects model which were tested were found; these may have been the result of interactions between explicit aspects to give new aspects. It is concluded that the model is valid for explicit aspects only when these aspects are independent. C.K.D.

A76-41324 **The effects of adaptation to stereoscopic depth and to unocular image magnification on the duration of short-term visual storage.** H. C. van der Meer (Nijmegen, Katholieke Universiteit, Nijmegen, Netherlands). *Acta Psychologica*, vol. 40, Aug. 1976, p. 311-323. 53 refs.

Page Intentionally Left Blank

STAR ENTRIES

N76-28804 California Univ., Berkeley.

ENZYMES IN HETEROGENEOUS SYSTEMS Ph.D. Thesis
Alan James Benesi 1975 165 p

Avail: Univ. Microfilms Order No. 76-15110

Investigations involving enzymes in heterogeneous systems were undertaken: (1) experiments in which papain activity was used as a microenvironmental redox meter demonstrated that the redox potential in the vicinity of a charged interface can be significantly different than that of the bulk solution when the redox agents bear unlike charges; (2) a theoretical mathematical treatment of residence times of molecules in columns was used to demonstrate that the phenomenon of convective dispersion increases the average residence time of molecules in a column; (3) a simple experimental investigation of the dependence of apparent soil enzyme activity on soil particle size clearly demonstrated that diffusion can limit observed soil enzyme reaction rates; and (4) experiments with a mitochondrial membrane enzyme malate dehydrogenase revealed that nonionic detergent micelles double observed first-order reaction rates (and lower the affinity constant by a factor of 2). Dissert. Abstr.

N76-28805 Arizona Univ., Tucson.

THE SYNTHESIS OF SPECIFICALLY DEUTERATED AMINO ACIDS AND PERTIDES FOR USE IN BIOPHYSICAL STUDIES Ph.D. Thesis

Donald Allen Upson 1975 126 p

Avail: Univ. Microfilms Order No. 76-14547

The synthesis is reported of specifically deuterated S-benzyl cysteine derivatives deuterated in the alpha position only, the beta position only, and in the alpha and beta positions simultaneously. These compounds were used to introduce specifically deuterated cysteine into the neurohypophyseal hormones oxytocin and [8-arginine] vasopressin at the 1-hemi- or the 6-hemi-cystine positions. Also reported is the synthesis of alpha deuterated isoleucine and its inclusion into the 3 position of oxytocin. In addition to the deuterated hemi-cystine derivatives of [8-arginine] vasopressin, alpha deuterated phenylalanine was synthesized and incorporated into the 3 position of this peptide hormone. Within the framework of the above syntheses, several methodological questions of peptide and amino acid synthesis were studied. Dissert. Abstr.

N76-28806 Rochester Univ., N.Y.

NONLINEAR DIFFUSION MODELS AND SPATIAL INTERACTIONS IN BIOLOGICAL SYSTEMS Ph.D. Thesis

Ronald Morris Shymko 1976 167 p

Avail: Univ. Microfilms Order No. 76-14787

The effects of spatial structure on the qualitative dynamics of nonlinear biological systems are studied. Nonlinearly coupled diffusion equations are set up in order to take into account the spatial transport of the active components, and the possible modes of behavior are determined. Changes in the qualitative behavior (bifurcations) are found to occur as the spatial parameters such as size or shape are varied. Topics considered include: (1) a two-component coupled chemical system with spatially localized (heterogeneous) catalysts; (2) a mathematical model for the control of tissue growth by a diffusible mitotic inhibitor; and (3) a dynamical model for vision which incorporates the nonlinearities and lateral interactions known to exist in the visual system. Dissert. Abstr.

N76-28807*# Agence Tunisienne de Public-Relations, Tunis.
NATURAL HISTORY OF AGARICINES

M. V. Fayod Washington NASA Jul. 1976 290 p refs
Transl. into ENGLISH from Ann. Sci. Natur., Bot. Biol. Veg. (France), vol. 7, no. 9, May. 1888 p 181-411
(Contract NSF C-504)

(NASA-TT-F-16514) Avail: NTIS HC \$9.25 CSCL 06C

A Class of fungi, the Basidiomycetes, was studied (specifically, the Order Agaricales, which includes all forms of fleshy gilled mushrooms). Topics discussed include: (1) biological classification, (2) the morphology of fungal structures such as mycelium, sclerotial bodies, spores, stipes, gills, and pileus, and (3) reproductive cycles. Reference is made, where applicable, to the works of De Bary and other mycologists. A brief review of the natural groups of Agaricaceae is given. Also discussed are methods of collection and preservation for these fungi. J.R.T.

N76-28808*# Boeing Co., Houston, Tex.

TWO TECHNIQUES FOR ELIMINATING LUMINOL INTERFERENCE MATERIAL AND FLOW SYSTEM CONFIGURATIONS FOR LUMINOL AND FIREFLY LUCIFERASE SYSTEMS Quarterly Report, Jan. - Mar. 1976

Richard R. Thomas Jan. 1976 18 p refs

(Contract NAS5-22545)

(NASA-CR-144768) Avail: NTIS HC \$3.50 CSCL 06C

Two methods for eliminating luminol interference materials are described. One method eliminates interference from organic material by pre-reacting a sample with dilute hydrogen peroxide. The reaction rate resolution method for eliminating inorganic forms of interference is also described. The combination of the two methods makes the luminol system more specific for bacteria. Flow system designs for both the firefly luciferase and luminol bacteria detection systems are described. The firefly luciferase flow system incorporating nitric acid extraction and optimal dilutions has a functional sensitivity of $3 \times 100,000$ E. coli/ml. The luminol flow system incorporates the hydrogen peroxide pretreatment and the reaction rate resolution techniques for eliminating interference. The functional sensitivity of the luminol flow system is $1 \times 10,000$ E. coli/ml. Author

N76-28809 Kansas Univ., Lawrence.

RECOVERY DURING RADIATION AND CHEMICAL MUTAGENESIS Ph.D. Thesis

Dennis Frank Deen 1975 213 p

Avail: Univ. Microfilms Order No. 76-16714

These investigations were directed toward the study of recovery in radiation and chemical mutagenesis in cultured mammalian cells. A mutagenesis system was established in which mutation of V79-171b Chinese hamster cells to 8-azaguanine resistance was tested. The effects of split dose and postirradiation treatments upon both X-ray and EMS induced mutagenesis were determined. Observations and conclusions are presented. Dissert. Abstr.

N76-28810 Utah Univ., Salt Lake City.

DIAGNOSTIC APPLICATION OF MICROWAVE RADIATION Ph.D. Thesis

Peder Christian Pedersen 1976 178 p

Avail: Univ. Microfilms Order No. 76-16574

The feasibility of applying low intensity microwave radiation in the diagnosis and monitoring of pathological pulmonary conditions such as pulmonary edema and emphysema is considered. The significant change in total lung water which is a characteristic of pulmonary edema and emphysema modifies the permittivity and conductivity of the lung tissue. Both the reflection technique and the transmission technique have been investigated with single frequency and swept frequency measurements. With the single frequency reflection technique, dynamic events such as respiration or cardiac rhythm have been measured, and animal experiments have indicated that this technique is applicable for monitoring of the progress of pulmonary edema. Using the swept frequency transmission technique, the transmission coefficient was measured on a phantom model of the chest. Changing the 'lung' water content of the phantom model produced significant changes in the transmission coefficient later confirmed by theoretical calculations. Dissert. Abstr.

N76-28811 Texas Univ., Austin.

THE MEASUREMENT OF THRESHOLD TEMPERATURES IN THE OCULAR FUNDUS FOR LASER INDUCED, VISIBLE LESIONS Ph.D. Thesis

Leslie Alexander Priebe 1975 209 p

Avail: Univ. Microfilms Order No. 76-14505

Measurements of temperature increases resulting from exposures to argon laser irradiations were made in the eyes of living rhesus monkeys with 10-20 micrometers thermocouples. Using the appearance of an ophthalmoscopically visible lesion as the criterion for damage, the temperature associated with the appearance of a threshold lesion 5 minutes post exposure was determined. Temperature increases at the center of the lesion and at the radial extent of the lesion were determined from radial scans of the thermocouple through the laser image and from ophthalmoscope measurements of the lesion radius.

Dissert. Abstr.

N76-28812 Utah Univ., Salt Lake City.

LONG-WAVELENGTH ANALYSIS OF ELECTROMAGNETIC POWER ABSORPTION BY PROLATE SPHEROIDAL AND ELLIPSOIDAL MODELS OF MAN Ph.D. Thesis

Habibollah Massoudi 1976 217 p

Avail: Univ. Microfilms Order no. 76-15572

An electromagnetic (EM) field perturbation technique is used to obtain the induced fields and the associated power deposition in both prolate spheroidal and ellipsoidal models of man and experimental animals being irradiated by an EM plane wave when the wavelength is long compared to the major axis of the spheroid or ellipsoid. Calculations of the power absorbed by both spheroidal and ellipsoidal models of man and animals are given for different frequencies and orientations of the models with respect to the incident field vectors. The effects of tissue anisotropy on power absorption in planar and spherical models are also investigated. The results show that marked differences in tissue absorbed power can occur due to tissue anisotropy at frequencies below 10 MHz. The quantitative data resulting from this study are valuable for estimating tissue EM power absorption in experimental animals and man.

Dissert. Abstr.

N76-28813*# Joint Publications Research Service, Arlington, Va.

EFFECTS OF ABRUPT TIME ZONE CHANGE ON SOME CIRCADIAN RHYTHMS IN MAN

N. I. Moiseyeva Washington NASA Jul. 1976 10 p refs Transl. into ENGLISH from Fiziol. Zh. SSSR (USSR), v. 61, no. 12, Dec. 1975 p 1798-1804

(NASA Order W-13183)

(NASA-TT-F-17117) Avail: NTIS HC \$3.50 CSCL 06P

Changes have been demonstrated in circadian rhythm indices of the cardiovascular system in essentially healthy individuals, in the course of transmeridional flights, particularly when crossing over 9 time zones. The nature of the changes depends on the direction of the flight. After flying to the east, the reactions appear immediately: decreased duration of sleep, arterial pressure drops, and there is leveling off of daily fluctuations of cardiovascular system indices. After flying to the west, the changes begin on the 2d day: shorter duration of sleep, change in sleep pattern, increased range of changes in EEG frequencies, altered fluctuations of tonus of the cardiovascular system. The sleep rhythm disturbances associated with flights in both directions disappear in about 1 week; the cardiovascular system changes disappear in 2 weeks after flying west and in over 1 month after flying east. Intake of soporifics during the flight accelerates the process of adaptation to new time zones.

Author

N76-28814*# Kanner (Leo) Associates, Redwood City, Calif. DRUG/RECEPTOR INTERACTIONS: THE EXAMPLE OF THE CARDIAC GLYCOSIDE RECEPTOR OF THE ERYTHROCYTE MEMBRANE

Erland Erdmann Washington NASA Aug. 1976 17 p refs Transl. into ENGLISH from Blut. (West Ger.), vol. 32, no. 2, 1976 p 61-70

(Contract NASw-2790)

(NASA-TT-F-17151) Avail: NTIS HC \$3.50 CSCL 06E

An example of an analysis of a drug/receptor interaction is described. According to this analysis the receptor for cardiac glycosides is on the outside of the erythrocyte membrane and is located on a protein which spans the membrane. This protein is believed to be $(Na^{+} + K^{+})$ -ATPase.

Author

N76-28815# Little (Arthur D.), Inc., Cambridge, Mass.

CURRENT AWARENESS SERVICE FOR TOXIC SUBSTANCES (CATS). CUMULATIVE REPORT NO. 1, PART 1

Dec. 1975 500 p refs

(Contract EPA-68-01-2694)

(PB-250074/2; EPA-560/7-75-003-1; ADL-C-77355-Pt-1)

Avail: NTIS HC \$12.50; HC also available in set of 2 reports as PB-250073-SET, HC \$24.00 CSCL 06T

The two part cumulative report contains 26 current awareness documents prepared biweekly from 26 August 1974 through 11 August 1975, during the first year of a two year project. The purpose of this project was to provide the Office of Toxic Substances (OTS), U.S. Environmental Protection Agency with information on new uses of existing chemical products and with information of obvious potential environmental concern for both new and existing chemical products. For each biweekly document a core list of approximately 80 journals was scanned for information of interest to OTS on more than 30 topics (compounds, classes of compounds, and subject areas, e.g., model ecosystems). Abstracts were prepared for all items selected and these abstracts were presented biweekly under the assigned topics. In addition, a 'General Information' section was added to accommodate abstracts for topics not included in the original list of scanning topics.

GRA

N76-28816# Little (Arthur D.), Inc., Cambridge, Mass.

CURRENT AWARENESS SERVICE FOR TOXIC SUBSTANCES (CATS). CUMULATIVE REPORT NO. 1, PART 2

Dec. 1975 507 p refs

(Contract EPA-68-01-2694)

(PB-250075-9; EPA-560/7-75/003-2; ADL-C-77355-Pt-2)

Avail: NTIS HC \$12.75; HC also available in set of 2 reports as PB-250073-SET, HC \$24.00 CSCL 06T

For abstract, see part 1.

N76-28817# National Inst. for Occupational Safety and Health, Rockville, Md.

CRITERIA FOR A RECOMMENDED STANDARD. OCCUPATIONAL EXPOSURE TO CARBON TETRACHLORIDE

Dec. 1975 155 p refs

(PB-250424/9; NIOSH-TR-76-133) Avail: NTIS HC \$6.75 CSCL 06J

Recommended standards for safe exposure levels to chemical hazards found in the workplace are presented. It is recommended that occupational exposure shall be controlled so that workers are not exposed to carbon tetrachloride in excess of 2 ppm (12.6 mg/cu m) determined as a timeweighted average (TWA) exposure for up to a 10-hour workday, 40-hour workweek. Recommendations on environmental exposure, medical, labeling, sampling and analysis, personal protection, informing employees of the hazard, work practices and monitoring and record keeping are included.

GRA

N76-28818 Illinois Univ., Urbana.

TOWARD A RESPIRATOR CONTROL SYSTEM Ph.D. Thesis

John Peter Schill 1976 142 p

Avail: Univ. Microfilms Order No. 76-16189

The physiology of a patient who requires a respirator is deranged in a sufficiently unique manner as to make a general complex modeling impractical. A basic approach is taken emphasizing the gas exchange function of the human respiratory system and the maintenance of this exchange through proper use of pulmonary mechanics. A model that is amenable to application control theory is developed and justified. Optimal control theory is applied to the dynamic equations of the model to yield design equations (control laws) of a controller. Several different formulations of the control problem are considered and comparisons made. Specifically, the continuous formulation of

the control problem for both time optimal and quadratic performance indexes, sampled-data formulation for both time optimal and quadratic performance indexes, and the continuous time optimal maximum principle formulation are considered.

Dissert. Abstr.

N76-28819*# Massachusetts Inst. of Tech., Cambridge. Man-Vehicle Lab.

INTEGRATION OF VISUAL AND MOTION CUES FOR SIMULATOR REQUIREMENTS AND RIDE QUALITY INVESTIGATION Semiannual Status Report, Dec. 1975 - Jun. 1976

Laurence R. Young Jun. 1976 164 p refs

(Grant NGR-22-009-701)

(NASA-CR-148479) Avail: NTIS HC \$6.75 CSCL 08H

Practical tools which can extend the state of the art of moving base flight simulation for research and training are developed. Main approaches to this research effort include: (1) application of the vestibular model for perception of orientation based on motion cues; optimum simulator motion controls; and (2) visual cues in landing. Author

N76-28820*# Massachusetts Inst. of Tech., Cambridge. Dept. of Chemistry.

MONITORING SPACECRAFT ATMOSPHERE CONTAMINANTS BY LASER ABSORPTION SPECTROSCOPY Final Technical Report, 1 Jan. 1974 - 31 Aug. 1976

J. I. Steinfeld 31 Aug. 1976 124 p refs

(Grant NGR-22-009-766)

(NASA-CR-148481) Avail: NTIS HC \$5.50 CSCL 06K

Laser-based spectrophotometric methods which have been proposed for the detection of trace concentrations of gaseous contaminants include Raman backscattering (LIDAR) and passive radiometry (LOPAIR). Remote sensing techniques using laser spectrometry are presented and in particular a simple long-path laser absorption method (LOLA), which is capable of resolving complex mixtures of closely related trace contaminants at ppm levels is discussed. A number of species were selected for study which are representative of those most likely to accumulate in closed environments, such as submarines or long-duration manned space flights. Computer programs were developed which will permit a real-time analysis of the monitored atmosphere. Estimates of the dynamic range of this monitoring technique for various system configurations, and comparison with other methods of analysis, are given. Author

N76-28821*# Civil Aeromedical Inst., Oklahoma City, Okla. **EARPLUG RANKINGS BASED ON THE PROTECTOR-ATTENUATION RATING (P-AR)**

Jerry V. Tobias Oct. 1975 62 p refs

(AD-A024756/9; FAA-AM-75-11) Avail: NTIS HC \$4.50 CSCL 06/17

Forty-five attenuation spectra for earplugs were classified according to a simplified method designed to produce single number ratings of noise reduction. The rating procedure was applied to the mean attenuation scores, to mean-minus-one-standard-deviation scores, and to mean-minus-two-standard-deviations scores. The reporting of all three numbers seems to give the fairest indication of an earplug's value in controlling hearing damage in noise-exposed populations. The tests are described and ranked. Author

N76-28822* Systems Technology, Inc., Hawthorne, Calif. **A MODEL FOR HUMAN PILOT BEHAVIOR DURING WAKE VORTEX ENCOUNTER UPSETS** Final Report, Jun. 1974 - Dec. 1975

Walter A. Johnson and Thomas T. Myers Apr. 1976 38 p refs

(Contract DOT-FA73WA-3276)

(AD-A024534/0; TR-1035-5; FAA-RD-76-8) Avail: NTIS HC \$4.00 CSCL 06/19

A model for pilot behavior is needed to more completely analyze the consequences (including hazard assessment) of wake vortex encounter upsets during final approach. Such a model was developed to describe a pilot's roll control behavior during

a vortex upset. This model resulted from abstracting the salient characteristics of the many vortex encounters recorded during two moving-base piloted simulations at NASA Ames Research Center. The model allows for several discrete modes of behavior and includes an associated set of switching logics. The model is the result of a lengthy sequence of analytical steps. A description of the resulting model and several example applications are presented. Author

N76-28823* Bureau of Mines, Pittsburgh, Pa. Mining and Safety Research Center.

DEVELOPMENT OF TWO NEW OXYGEN SELF-RESCUERS

R. L. Stein Jan. 1976 32 p refs

(PB-250809/1; BM-RI-8102) Avail: NTIS HC \$4.00 CSCL 06K

The new oxygen self-rescuers are designed to be carried by a miner while he is at work and are used during emergency escape. These devices supply high-purity oxygen to the user and, at the same time, absorb CO₂. One of the new self-rescue breathing units is a 10-minute self-contained apparatus. Its size and weight are comparable to the currently used self-rescue devices. The second device is a 4.5 lb package that supplies one hour of oxygen to the miner. Both devices have a canister that contains the oxygen-producing and CO₂-absorbing potassium superoxide chemical, a breathing bag, a bite-type mouthpiece, noseclip, goggles, and hoses connecting the canister and mouthpiece. GRA

N76-28824* Ultrasonics, Inc., Phoenix, Ariz. Dynamic Science Div.

EVALUATION OF SELF-CONTAINED ANTHROPOMORPHIC DUMMY DATA ACQUISITION SYSTEM Final Report, 1 Oct. - 31 Dec. 1975

E. Enserink Feb. 1976 143 p

(Contract DOT-HS-6-01295)

(PB-250722/6; DOT-HS-801-827; Rept-3961-75-178) Avail: NTIS HC \$6.00 CSCL 14B

The test program evaluated a self contained solid state digital data acquisition system mounted in a 50th percentile male anthropomorphic dummy. Five automobile crash tests of various types were conducted with the crash recorder-equipped dummy occupying different seating positions in each test and restrained by either conventional belts or an air cushion restraint system. Following each test the data were extracted from the self contained recorder and transcribed onto a magnetic tape for further processing and the computation of dummy injury criteria. Author (GRA)

N76-28825* Army Environmental Hygiene Agency, Aberdeen Proving Ground, Md.

PERSONAL HEARING PROTECTIVE DEVICES, FITTING, CARE, AND USE

Doug Ohlin Jan. 1975 54 p refs

(AD-A021408) Avail: NTIS CSCL 06/17

The technical guide gives guidance for the establishment of occupational hearing conservation programs and information deemed useful for personnel having the responsibility for fitting and issuing hearing protective devices. GRA

N76-29891* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

METHOD OF DETECTING AND COUNTING BACTERIA Patent

Grace L. Picciolo and Emmet W. Chappelle, inventors (to NASA)

Issued 27 Jul. 1976 6 p Filed 5 Mar. 1975 Supersedes

N75-21921 (13 - 13, p 1548) Continuation-in-part of abandoned

US Patent Appl. SN-475337, filed 31 May 1974

(NASA-Case-GSC-11917-2; US-Patent-3,971,703;

US-Patent-Appl-SN-475337; US-Patent-Appl-SN-555641;

US-Patent-Class-195-103.5R) Avail: US Patent Office CSCL 06M

An improved method is provided for determining bacterial levels, especially in samples of aqueous physiological fluids. The method depends on the quantitative determination of bacterial adenosine triphosphate (ATP) in the presence of nonbacterial

ATP. The bacterial ATP is released by cell rupture and is measured by an enzymatic bioluminescent assay. A concentration technique is included to make the method more sensitive. It is particularly useful where the fluid to be measured contains an unknown or low bacteria count. Official Gazette of the U.S. Patent Office

N76-29892* Oregon Univ., Portland. Dept. of Neurology. **DEFINITION OF PERFORMANCE SPECIFICATIONS FOR AUTOMATED ANALYTICAL ELECTROPHORESIS FACILITY (AAEF) Final Report, 7 Apr. 1975 - 29 Feb. 1976**

D. E. Brooks 29 Feb. 1976 137 p refs
(Contract NAS8-31386)

(NASA-CR-149957) Avail: NTIS HC \$6.00 CSCL 06B

In order to provide specifications for the automated Analytical Electrophoresis Facility (AAEF) that would satisfy the broadest variety of demands of a future user community, a survey was carried out of all those people who were identified as having published papers on cell electrophoresis in the past four years. A computer search was conducted of the relevant literature from which a list of 87 investigators was derived and defined as the user community for purposes of the mailing. A questionnaire was developed covering the areas of performance which required definition which was subsequently circulated to the user community. Based on the response to this survey performance specifications were assembled. Author

N76-29893# Wisconsin Univ. - Parkside, Kenosha. **EFFECTS OF EXTREMELY LOW FREQUENCY ELECTROMAGNETIC FIELDS ON PHYSARUM POLYCEPHALUM Technical Report, 15 Sep. 1971 - 31 Dec. 1975**

E. M. Goodman, Ben Greenbaum, and Michael T. Marron 1 Feb. 1976 67 p refs

(Contract N00014-76-C-0180; NR Proj. 201-126)

(AD-A021457) Avail: NTIS CSCL 06/18

When the myxomycete *Physarum polycephalum* is exposed to sinusoidal (45, 60, 75 Hz) or modulated (76 Hz) electromagnetic fields, the mitotic cycle is lengthened, shuttle streaming period is slowed, and the rate of respiration is depressed. Further, modulated fields appear to induce these alterations sooner and at lower intensities than sinusoidal waves. The findings so far do not admit a conclusion that exposure to weak ELF electromagnetic fields is deleterious for *Physarum* (or other organisms); it can be concluded, however, that these fields do significantly affect biological processes. GRA

N76-29894* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

MINIATURE INGESTIBLE TELEMETRY DEVICES TO MEASURE DEEP-BODY TEMPERATURE Patent

Jack M. Pope and Thomas B. Fryer, inventors (to NASA) Issued 27 Jul. 1976 5 p Filed 27 Oct. 1972 Supersedes N73-14093 (11 - 05, p 0503)

(NASA-Case-ARC-10583-1; US-Patent-3,971,362; US-Patent-Appl-SN-301418; US-Patent-Class-128-2P; US-Patent-Class-128-2H; US-Patent-Class-128-2.1A) Avail: US Patent Office CSCL 06B

A telemetry device comprised of a pill-size ingestible transmitter developed to obtain deep body temperature measurements of a human is described. The device has particular utility in the medical field where deep body temperatures provide an indication of general health.

Official Gazette of the U.S. Patent Office

N76-29895* National Aeronautics and Space Administration. Pasadena Office, Calif.

MYOCARDIUM WALL THICKNESS TRANSDUCER AND MEASURING METHOD Patent

Cyril Feldstein (JPL), Gilbert W. Lewis (JPL), Robert H. Silver (JPL), and Virgil H. Culler, inventors (to NASA) (JPL) Issued 27 Jul. 1976 6 p Filed 5 May 1975 Supersedes N75-22689 (13 - 14, p 1652) Sponsored by NASA

(NASA-Case-NPO-13644-1; US-Patent-3,971,363; US-Patent-Appl-SN-574218; US-Patent-Class-128-2S; US-Patent-Class-128-2.05R; US-Patent-Class-338-6) Avail: US Patent Office CSCL 06B

A miniature transducer for measuring changes of thickness of the myocardium is described. The device is easily implantable without traumatizing the subject, without affecting the normal muscle behavior, and is removable and implantable at a different muscle location. Operating features of the device are described.

Official Gazette of the U.S. Patent Office

N76-29896* National Aeronautics and Space Administration. Pasadena Office, Calif.

CATHETER TIP FORCE TRANSDUCER FOR CARDIOVASCULAR RESEARCH Patent

Cyril Feldstein (JPL), Gilbert W. Lewis (JPL), Robert H. Silver (JPL), and Virgil H. Culler, inventors (to NASA) (JPL) Issued 27 Jul. 1976 5 p Filed 16 May 1975 Supersedes N75-25598 (13 - 16, p 2022) Sponsored by NASA

(NASA-Case-NPO-13643-1; US-Patent-3,971,364; US-Patent-Appl-SN-578241; US-Patent-Class-128-2S; US-Patent-Class-128-2.05E; US-Patent-Class-128-2.06E; US-Patent-Class-128-418; US-Patent-Class-128-419P; US-Patent-Class-73-398AR) Avail: US Patent Office CSCL 06B

A force transducer for measuring dynamic force activity within the heart of a subject essentially consists of a U-shaped beam of low elastic compliance material. Two lines extend from the beam's legs and a long coil spring is attached to the beam. A strain gauge is coupled to one of the beam's legs to sense deflections thereof. The beam with the tines and most of the spring are surrounded by a flexible tube, defining a catheter, which is insertable into a subject's heart through an appropriate artery. The tines are extractable from the catheter for implantation into the myocardium by pushing on the end of the spring which extends beyond the external end of the catheter.

Official Gazette of the U.S. Patent Office

N76-29898* Cornell Univ., New York. Lab. of Neurobiology.

CENTRAL NEURAL MECHANISMS GOVERNING POSTURAL CARDIOVASCULAR MECHANISMS Final Technical Report, 15 Jun. 1972 - 14 Jun. 1976

Donald J. Reis 14 Jun. 1976 293 p refs

(Grant NGR-33-010-179)

(NASA-CR-148603) Avail: NTIS HC \$9.25 CSCL 06P

The results of the vestibular apparatus and cerebellum in orthostatic reflex control are summarized. Mechanisms within the brain which govern circulation reflexes and the consequences of disturbances in their function are also included. Author

N76-29899# Polish Academy of Sciences, Warsaw. **THERMAL EFFECT IN THE SOFT TISSUE FOR THE CASE OF FOCUSED ULTRASONIC FIELDS OF SHORT DURATION TIME**

Leszek Filipczynski 1 Dec. 1975 19 p refs In POLISH; ENGLISH summary

Avail: NTIS HC \$3.50

The temperature rise in the soft tissue was estimated for the case of focused ultrasonic beams as used in ultrasonography. Solving the heat conduction equation with the use of Laplace a transform a formula was obtained which makes it possible to calculate the approximate temperature distribution, in the focus perpendicularly to the beam axis, as a function of time. The temperature increase for a 1 s pulse duration is of the same order as obtained in other experiments. For the ultrasonic dosage of 200 W/sq cm and 1 s time duration which corresponds with the threshold values for irreversible changes in the brain, a temperature rise of 33 C is obtained. F.O.S.

N76-29900# Oak Ridge National Lab., Tenn. Carcinogenesis Program.

INTERACTIONS OF CARCINOGENS WITH HUMAN CELL DNA: DAMAGE AND REPAIR

J. D. Regan 1975 18 p refs Presented at the Satellite of IUPHAR Cong., Turku, Finland, 25 Jul. 1975 Sponsored by ERDA

(Conf-750745-1) Avail: NTIS HC \$4.00

The DNA of human cells was exposed to UV radiation, gamma radiation, N-acetoxyacetoamino fluorene, 4-nitroquinoline oxide,

ethyl methane sulfonate, propane sulfone, and ICR-170. Following dBrVrd incubation and exposure to 313 nm radiation the number of strand breaks was recorded; the number of dBrVrd nucleotides inserted was also recorded. The significance of the results is discussed. NSA

N76-29901# Travenol Labs., Inc., Morton Grove, Ill.
TOXICITY OF COMPONENTS OF PLASTIC HAVING CONTACT WITH BLOOD Final Technical Progress Report, Jun. 1972 - Mar. 1975

J. E. Miripol, P. J. Garvin, I. J. Stern, and R. F. Wallin Sep. 1975 340 p refs
 (Contract HB-22990)
 (PB-251742/3; NIH-N01-HB-22990) Avail: NTIS HC \$10.00 CSCI 06T

Changes in the apparent volume of distribution of Di-(2-ethylhexyl) phthalate (DEHP) observed when aqueous suspensions were used for injection of the plasticizer indicated that differences in the systemic disposition and distribution of DEHP were dependent on the physical state of the dosage form. Whole body autoradiographic studies performed on mice infused with serum containing ¹⁴C-DEHP showed rapid accumulation labeled carbon in the kidney and liver with rapid excretion into urine, bile, and intestine. Essentially all the labeled compound was excreted within 24 hours. Rats infused twice weekly for 60 days with rat plasma containing DEHP extracted from PVC exhibited no toxicologically significant changes when compared to controls. GRA

N76-29902# Stanford Research Inst., Menlo Park, Calif.
EFFECTS OF OXIDANT AND SULFATE INTERACTION ON PRODUCTION OF LUNG LESIONS Final Report

Gustave Freeman and Laszlo T. Juhos Jan. 1976 29 p
 (Contract EPA-68-02-1944)
 (PB-251729/0; EPA-600/1-76-009) Avail: NTIS HC \$4.00 CSCI 06T

An investigation is presented that was designed to determine the sub-acute and chronic effects of sulfuroxide inhalation alone and in combination with oxidant exposure on the respiratory system of laboratory animals. Preliminary experiments were being conducted to determine the optimum concentration of small-particle H₂SO₄ exposure to use in subsequent H₂SO₄-oxidant experiments. The comparative response of rats, guinea pigs and monkeys was determined. The effects of SO₂-O₃ mixtures were determined also. The principal biologic responses studied were the histopathologic response, including ultrastructural studies and autoradiographic assessment of cell turnover rates, biochemical studies and physiologic measurements. GRA

N76-29903# Southwest Research Inst., San Antonio, Tex.
BASELINE LEVELS OF PLATINUM AND PALLADIUM IN HUMAN TISSUE Final Report

Donald E. Johnson, R. John Prevost, John B. Tillery, David E. Camann, and John M. Hosenfeld Mar. 1976 252 p refs
 (Contract EPA-68-02-1274)
 (PB-251885/0; EPA-600/1-76-019) Avail: NTIS HC \$9.00 CSCI 06T

The objective is to determine baseline levels of platinum and palladium in the population and environment prior to wide-spread use of catalyst-equipped vehicles. Lead is determined to ascertain the future epidemiological effect of non-leaded gasoline. The report presents the results of an epidemiological study of populations living near a freeway in Los Angeles, California and in the high desert region of Lancaster, California, for concentrations of platinum, palladium, and lead in blood, urine, hair, feces, autopsy tissues, ambient air, surface water and soil. Platinum and palladium are determined in samples from miners in Sudbury, Ontario, Canada, and metal refinery workers in New Jersey. Analytical methods are developed for platinum, palladium, and lead using atomic absorption spectrophotometry. GRA

N76-29904# Desmatics, Inc., State College, Pa.
RESEARCH ON CONSTRUCTION OF A STATISTICAL MODEL FOR PREDICTING IMPACT ACCELERATION INJURY

Dennis E. Smith Feb. 1976 35 p refs
 (Contract N00014-74-C-0154; NR Proj. 105-757)
 (AD-A021669; TR-102-2) Avail: NTIS CSCI 06/19

This report describes a statistical approach to development of a human impact acceleration injury prediction model based on experimental data obtained from human analogs. Also discussed is the use of preinjury criteria to provide more accurate estimates of model parameters. Author (GRA)

N76-29905# Optical Sciences Group, San Rafael, Calif. Visual Sciences Div.

INFLUENCE OF SOCIALLY USED DRUGS ON VISION AND VISION PERFORMANCE Annual Report, 1974 - 1975

Anthony J. Adams, Brian Brown, Merton C. Flom, Arthur Jamolsky, and Reese T. Jones 1 Apr. 1975 115 p refs
 (Contract DADA17-73-C-3106)
 (AD-A022024; Rept-751) Avail: NTIS CSCI 06/16

Eight visual functions were measured in these experiments; twenty-seven experienced marijuana and alcohol users participated. The experiments were performed double blind with placebo controls. The results are: (1) Dynamic visual acuity is reduced in dose-related-fashion by both alcohol and marijuana; (2) Alcohol produces large, dose-related increases in time taken to recover foveal sensitivity after bright light exposure; (3) Recovery of contrast sensitivity function in the peripheral retina after exposure to a bright light flash is prolonged by 1.0 ml/kg alcohol; (4) The maximum velocity of sinusoidal tracking is markedly reduced by alcohol and not by marijuana. This effect for the smooth pursuit system and the saccadic eye movement system is dose related for both systems; (5) Using power spectrum analysis, the investigators (a technique which allows examination of individual frequency components of eye movements), we the investigators have demonstrated alcohol and marijuana induced deficits in oculomotor tracking; (6) Color discrimination appears to be significantly reduced after alcohol (1.0 ml/kg) and marijuana (15 mg THX) in the blue region without apparent change in other spectral regions; (7) Static visual acuity, is unaffected by alcohol or marijuana in doses up to 1.0 ml/kg of alcohol and 15 mg THC; and (8) Peripheral gaze nystagmus is increased after alcohol and to a lesser extent after marijuana ingestion. GRA

N76-29906# Civil Aeromedical Inst., Oklahoma City, Okla.
EFFECTS OF GROUND TRAINER USE ON THE PSYCHOLOGICAL AND PHYSIOLOGICAL STATES OF STUDENTS IN PRIVATE PILOT TRAINING

Roger C. Smith and C. E. Melton, Jr. Mar. 1976 9 p refs
 (AD-A024704/9; FAA-AM-76-2) Avail: NTIS HC \$3.50 CSCI 05/9

Student pilots receiving all instruction in an aircraft and student pilots who received a portion of their flight training in a ground trainer were compared in terms of flying proficiency, psychological (anxiety) states during training, and certain physiological measures. It was found that pilot performance was equal in both groups, as measured by objective ratings and check pilot observations. There was no evidence that student pilot anxiety was differentially influenced by these two training procedures, although anxiety did vary as a function of the type of flight (dual, solo, evaluation). There were some trends in the physiological data to suggest slightly more favorable conditions in the ground trainer. No contraindications to ground trainer use were evident. Author

N76-29907# National Aviation Facilities Experimental Center, Atlantic City, N.J.

INVESTIGATION OF PILOT SELF-BRIEFING TECHNIQUES. VOLUME 1: METHODOLOGY, RESULTS, AND RECOMMENDATIONS Interim Report, Mar. - Oct. 1974

Hugh D. Milligan and Bruce L. Rosenberg Feb. 1976 83 p
 (AD-A024645/4; FAA-NA-75-18-Vol-1; FAA-RD-75-90-Vol-1)
 Avail: NTIS HC \$5.00 CSCI 05/9

A study was conducted to assess the usefulness of automation techniques and devices developed for the purpose of providing pilots with the capability to obtain preflight weather briefings without the aid of a flight service station specialist. Both live and canned weather data were employed during the conduct of

the study to ascertain the validity of the basic concepts and to define improvements thereto. The data elicited from the activities, thus far, indicates that pilot self-briefing is a feasible approach which portends delivery of quality weather briefings with a concomitant cost reduction when compared to the cost of today's and any future labor intensive briefing system. This is a technical report containing information on design of the experiment; data collected, statistical analyses of results, and a summary narrative, conclusions and recommendations. Volume I contains the textual presentation of the experiments as well as the analyses and some tables presenting overall pilot responses. Author

N76-29908# Federal Aviation Administration, Oklahoma City, Okla.

AN EVALUATION OF THE EFFECTIVENESS OF THE FAA MANAGEMENT TRAINING SCHOOL

Roger C. Smith, Barbara Rana, and Deborah K. Taylor Sep. 1975 46 p refs
(AD-A025254/4; FAA-AM-75-9) Avail: NTIS HC \$4.00 CSCL 05/9

An assessment of the FAA Management Training School (MTS) program is presented. Questionnaires for evaluating the MTS experience in terms of the usefulness and the quality of specific and general aspects of the course were presented to graduates at various FAA field offices and facilities. It was found that supervisors and managers felt that the program had been useful in helping them to meet the demands of their positions. Areas in need of improvement are indicated. Questionnaires concerning specific types of behavior desired of supervisors and managers were completed by graduates of MTS, their immediate supervisors, and their employees and also by supervisors and managers not trained at MTS. It was found that MTS training resulted in an increase in desirable on-the-job activities of MTS graduates. Author

N76-29909*# McDonnell-Douglas Astronautics Co., Houston, Tex. Astronautics Div.

CONTINUATION OF ADVANCED CREW PROCEDURES DEVELOPMENT TECHNIQUES Final Report

J. D. Arbet, R. L. Benbow, M. E. Evans, A. A. Mangiaracina, J. L. McGavern, M. C. Spangler, and I. C. Tatum 30 Jul. 1976 64 p refs
(Contract NAS9-14780)

(NASA-CR-147843; MDC-W0018) Avail: NTIS HC \$4.50 CSCL 05/1

An operational computer program, the Procedures and Performance Program (PPP) which operates in conjunction with the Phase I Shuttle Procedures Simulator to provide a procedures recording and crew/vehicle performance monitoring capability was developed. A technical synopsis of each task resulting in the development of the Procedures and Performance Program is provided. Conclusions and recommendations for action leading to the improvements in production of crew procedures development and crew training support are included. The PPP provides real-time CRT displays and post-run hardcopy output of procedures, difference procedures, performance data, parametric analysis data, and training script/training status data. During post-run, the program is designed to support evaluation through the reconstruction of displays to any point in time. A permanent record of the simulation exercise can be obtained via hardcopy output of the display data and via transfer to the Generalized Documentation Processor (GDP). Reference procedures data may be transferred from the GDP to the PPP. Interface is provided with the all digital trajectory program, the Space Vehicle Dynamics Simulator (SVDS) to support initial procedures timeline development. Author

N76-29910*# Kanner (Leo) Associates, Annapolis, Md.

MODELING OF INTELLIGENT BEHAVIOR

N. M. Amosov, A. M. Kasatkin, and L. M. Kasatkina Washington NASA Aug. 1976 35 p refs Transl. into ENGLISH from the Russian Preprint-74-2

(Contract NASw-2790)

(NASA-TT-F-17126; Preprint-74-2) Avail: NTIS HC \$4.00 CSCL 05/1

A brief description is presented of the basic results produced in the course of experimental investigations of the capabilities of one heuristic approach to the problem of construction of models of thinking and intelligent behavior. Operating models of the process of human mental information processing are represented in the form of network structures with the semantics of M-networks and a specific excitation-inhibition system. Author

N76-29911# Civil Aeromedical Inst., Oklahoma City, Okla.

PHYSIOLOGICAL, SUBJECTIVE, AND PERFORMANCE CORRELATES OF REPORTED BOREDOM AND MONOTONY WHILE PERFORMING A SIMULATED RADAR CONTROL TASK

Richard I. Thackray, J. Powell Bailey, and R. Mark Touchstone Aug. 1975 11 p refs

(AD-A025426/8; FAA-AM-75-8) Avail: NTIS HC \$3.50 CSCL 01/2

Several male subjects performed a simulated air traffic control radar task for 1 hour. Subjects were equally divided into three time-of-day groups and tested at 1,000, 1,300, and 1,530. The subject's task was to respond as rapidly as possible to infrequent changes in alphanumeric symbols. Blood pressure, oral temperature, skin conductance, body movement, heart rate and heart-rate variability, and performance measures of mean response latency and variability of response latencies were monitored. In addition, subjects rated their levels of boredom, monotony, irritation, attentiveness, fatigue, and strain at the beginning and end of the session. Two extreme groups of eight subjects each were then formed on the basis of their rated boredom and monotony and compared with respect to changes in each of the measures during the task period. Author

N76-29912# National Aviation Facilities Experimental Center, Atlantic City, N.J.

VISUAL ATTENTION OF PRIVATE PILOTS, THE PROPORTION OF TIME DEVOTED TO OUTSIDE THE COCKPIT Final Report, May 1972 - Mar. 1975

Richard L. Sulzer and Gerald E. Skelton May 1976 25 p refs

(AD-A025468/0; FAA-NA-75-28; FAA-RD-76-80) Avail: NTIS HC \$4.00 CSCL 01/2

The direction of the pilot's visual attention was recorded during three series of flights in a small aircraft. It was found that pilots using visual flight rules (VFR) spent approximately 50 percent of the time looking outside the cockpit, an airsearch time much higher than previously recorded for air-carrier cockpits. The remainder of the time, while occupied in the cockpit, the pilot might be likely to miss seeing an approaching aircraft. Hence, a test environment for pilot warning systems intended to aid visual detection of potential threats should employ a pilot workload that produces a realistic proportion of visual attention available for outside search. Author

N76-29913# Naval Training Equipment Center, Orlando, Fla.

THE EFFECT OF DELAY IN THE PRESENTATION OF VISUAL INFORMATION ON PILOT PERFORMANCE Final Report, Apr. 1974 - Jul. 1975

Fred R. Cooper, William T. Harris, and Vincent J. Sharkey Dec. 1975 78 p refs

(NAVTRAEQUIPCEN Proj. 6948)

(AD-A021418; NAVTRAEQUIPC-H-250) Avail: NTIS CSCL 05/9

The effects of delay in the presentation of visual information on pilot performance during simulated carrier landing tasks were investigated. The TRADEC research flight simulator was used in conjunction with an Evans and Sutherland LDS 1 calligraphic visual display system for several different initial conditions, with and without delayed visual presentation, in conducting evaluations of pilot learning performance and piloting technique. The experimental construction, conduction, data analysis and results are presented. GRA

N76-29914# Human Resources Research Organization, Alexandria, Va.

GROUND OBSERVER ABILITY TO DETECT AND ESTIMATE

THE RANGE OF JET AIRCRAFT FLYING OVER HILLY TERRAIN

R. D. Baldwin, E. W. Frederickson, A. L. Kubala, M. R. McCluskey, and A. D. Wright Aug. 1968 100 p refs
(Contract DA-44-188-ARO-2)
(AD-A020657) Avail: NTIS CSCL 15/3

During a series of tests to provide operational and technical data for evaluating the capabilities of surface-based air defense systems against attacks by low-altitude high-performance aircraft, the capabilities of ground observers to detect and estimate the range to aircraft flying attack missions against prebriefed ground targets were examined. Observer performance was obtained for three aircraft flying three programmed speeds and two programmed altitudes. Sixteen observers searched a 180 deg sector for each trial, with early warning of an aircraft approach being provided for some trials. Three real time events--time at detection, time when the aircraft was at the estimated inbound range, and time when aircraft was at the estimated outbound range--were recorded for each observer for each trial. Author (GRA)

N76-29915# National Swedish Inst. for Building Research, Stockholm.

MENTAL AND PERCEPTUAL PERFORMANCE IN HEAT

Curt Johansson 1975 291 p refs
(PB-251439/6; D4:1975; ISBN-91-540-2463-3) Avail: NTIS HC \$9.25 CSCL 06S

A review of heat-stress studies suggested that mental, perceptual, and psychomotor tasks have mainly been studied in laboratory experiments performed on heat acclimatized fit young men. The subjects were usually given extensive practice on the performance tasks, which were well learned prior to heat load. The exposure time varied from less than one hour to several hours. The emphasis recently shifted from an exploration of the relation between constant ambient temperature and performance to studies of performance changes under controlled hyperthermia or as a function of ambient temperature swings. GRA

N76-29916# National Transportation Safety Board, Washington, D.C. Bureau of Aviation Safety.

CHEMICALLY GENERATED SUPPLEMENTAL OXYGEN SYSTEMS IN DC-10 AND L-1011 AIRCRAFT Special Study

3 Mar. 1976 46 p refs
(PB-252023/7; NTSB-AAS-76-1) Avail: NTIS HC \$4.00 CSCL 01B

The study examines the problems encountered in four recent decompression incidents with respect to the presentation, understanding, and use of chemically generated supplemental oxygen systems installed in DC-10 and L-1011 aircraft. These problems include lack of oxygen flow indications; headband adjustment difficulties; lack of mask stowage methods; unreliability of oxygen compartment doors; method of oxygen mask presentation; flight attendant training; and passenger briefings. The study finds that there is a need for design guidance from the FAA in the design of supplemental oxygen systems as well as a need for proving these systems by actual demonstration. GRA

N76-29917# Illinois Univ., Urbana. Coordinated Science Lab. **TRACKING: AN APPROACH TO DYNAMIC VISION AND HAND-EYE COORDINATION Ph.D. Thesis**

V. C. Jones Dec. 1975 76 p refs
(Contract DAAB07-72-C-0259)
(AD-A021674; R696; UIIU-ENG-75-2231) Avail: NTIS CSCL 09/2

Many applications for robots require the ability to work with moving objects. The problems encountered due to different types of motion are considered, and a method for providing a robot with real-time vision processing in dynamic environments is presented. By appropriately isolating the tracking task, it is possible to reduce the tracking problem to basic two dimensional pattern verification. Numerous features (potentially moving randomly) can be tracked while planning and recognition functions proceed independently. The tracking ability can also be used to

provide a robot with visual feedback in real time for hand-eye coordination. GRA

N76-29918# Army Medical Intelligence and Information Agency, Washington, D.C.

ANTARCTIC CLOTHING

Eduardo Garcia Soto 17 Feb. 1976 6 p Transl. into ENGLISH from Boletin, Instituto Antartico Chileno (Chile), no. 8, 1975 p 26-28

(AD-A021714; USAMIIA-K-6181) Avail: NTIS CSCL 06/17

By the summer of 1972, the Chilean Antarctic institute (INACH, Instituto Antartico Chileno) had carried out exploratory activities in the Antarctic, preferentially in the coastal zones including studies on the food chains of fishes, benthic communities, tide gauging, etc. Starting in 1973, with the definitive organization of the Glaciological Group, investigations began in this scientific discipline and made necessary going further into the continent, therefore confronting a series of new problems of a logistic variety further requiring penetration, supervision, prevention of risks, ranging inward from the coasts, compulsory self-sufficiency, etc. As a consequence of the above, the requirement exists for making adaptations in clothing as well as a number of modifications in equipment used. Recommendations derived from experimentation are presented. GRA

N76-29919# Harry Diamond Labs., Adelphi, Md.

FLUIDIC SENSORS FOR LIFE SUPPORT SYSTEMS

James W. Joyce and Robert L. Woods Oct. 1975 45 p refs (HDL Proj. 379434)

(AD-A022016; HDL-TM-75-17) Avail: NTIS CSCL 06/11

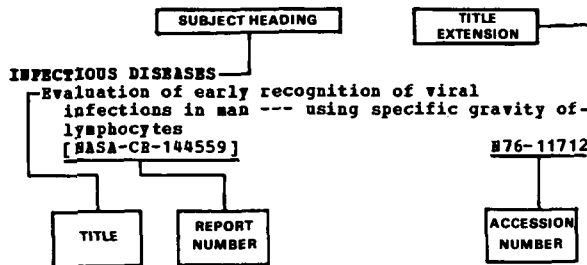
Flueric bridge sensors have been developed for the Air Force as candidate sensors for measuring gas concentrations and temperatures in life support systems aboard aircraft. Three manifold assemblies -- each containing two flueric concentration sensors and one flueric temperature sensor -- were designed, built, and laboratory tested. In addition, equations describing the theoretical performance of both types of sensors were derived. Measured resistive coefficients for all bridge elements show very little nonideal effects for flows below 3.5 cu cm/sec. For one of the concentration sensors, known mixtures of carbon dioxide in nitrogen were measured; the results were in complete agreement with the theoretical predictions. No temperature-sensing data were gathered in this program. Author (GRA)

SUBJECT INDEX

AEROSPACE MEDICINE AND BIOLOGY / *A Continuing Bibliography (Suppl. 160)*

NOVEMBER 1976

Typical Subject Index Listing



The title is used to provide a description of the subject matter. When the title is insufficiently descriptive of the document content, a title extension is added, separated from the title by three hyphens. The NASA or AIAA accession number is included in each entry to assist the user in locating the abstract in the abstract section of this supplement. If applicable, a report number is also included as an aid in identifying the document.

A

ABIOTENESIS

- Closed system Fischer-Tropsch synthesis over meteoritic iron, iron ore and nickel-iron alloy --- deuterium-carbon monoxide reaction catalysis
A76-39397
- Cyanogen induced phosphorylation of D-fructose --- prebiotic modeling
A76-40129
- On the origin of molecular 'handedness' in living systems --- paleomagnetic effects in prebiotic enantiomer synthesis
A76-40130
- Crystallization and solid-state reaction as a route to asymmetric synthesis from achiral starting materials
A76-40131
- Prebiotic peptide-formation in the solid state. II - Reaction of glycine with adenosine 5 prime-triphosphate and P₁, P₂-diadenosine-pyrophosphate
A76-40132
- Prebiotic peptide-formation in the solid state. III - Condensation reactions of glycine in solid state mixtures containing inorganic polyphosphates
A76-40133
- The prebiotic synthesis of deoxythymidine oligonucleotides. II - Comparison of condensing agents
A76-40134
- Compartmentalization of amino acids in surfactant aggregates - Partitioning between water and aqueous micellar sodium dodecanoate and between hexane and dodecylammonium propionate trapped water in hexane
A76-40135
- Formation of nucleoside 5'-polyphosphates from nucleotides and trimetaphosphate
A76-40136
- On the possible role of organic melanoidin polymers as matrices for prebiotic activity
A76-40137
- Aminoacyl transfer from an adenylate anhydride to polyribonucleotides
A76-40138
- Reactions of aminomalonnitrile with electrophiles --- simulating prebiotic conditions
A76-40139
- ### ABSORPTION SPECTROSCOPY
- Monitoring spacecraft atmosphere contaminants by laser absorption spectroscopy
[NASA-CR-148481]
N76-28820

ACCELERATION STRESSES (PHYSIOLOGY)

- Plasma vasopressin and renin activity in women exposed to bed rest and +G/z/ acceleration
A76-38803
- Cardiac pathology associated with high sustained +G/z/. I - Subendocardial hemorrhage
A76-39578
- Cardiac pathology associated with high sustained +G/z/. II - Stress cardiomyopathy
A76-39579
- Changes in clinical cardiologic measurements associated with high +G/z/ stress
A76-39580
- Cardiovascular function during sustained +G/z/ stress
A76-39584
- Response of the hydrodynamically interacting semicircular canals to an adequate stimulus
A76-40628
- Systolic time intervals during +Gz acceleration
A76-40887

ACOUSTIC MEASUREMENTS

- Orthogonal electrocardiogram, apex cardiogram, and atrial sound in normotensive and hypertensive 50-year-old men
A76-38930

ADEOSINE TRIPHOSPHATE

- Prebiotic peptide-formation in the solid state. II - Reaction of glycine with adenosine 5 prime-triphosphate and P₁, P₂-diadenosine-pyrophosphate
A76-40132

ADIPOSE TISSUES

- Metabolic adaptations in brown adipose tissue of the hamster in extreme ambient temperatures
A76-40199

ADRENERGICS

- Glucagon and plasma catecholamines during beta-receptor blockade in exercising man
A76-38801

AEROSOLISOL

- Resonance ultrasonic measurements of microscopic gas bubbles --- in living tissue
A76-39588

AEROSPACE MEDICINE

- A study on examination procedures for preventing traumatic and nontraumatic osteoarthropathies related to flying activities
A76-38701
- Making use of the laboratory in aerospace medicine
A76-38703
- Verification of hemostasis disorders in air force personnel
A76-38705
- Changes in clinical cardiologic measurements associated with high +G/z/ stress
A76-39580
- Application of hyperbaric oxygen therapy in a case of prolonged cerebral hypoxia following rapid decompression
A76-39585
- Psychotherapy and return to flying duties
A76-39587
- Jet lag isn't just a state of mind --- prolonged flight effects on circadian dysrhythmia
A76-40127
- Control and modeling of physiological processes --- Russian book
A76-40627

AFERENT NERVOUS SYSTEMS

- Hypothalamic and thalamic blood flow during somatic afferent stimulation in dogs
A76-40200

AIR DEFENSE

SUBJECT INDEX

- Investigation of cerebrospinal reflexes - A review of the concept of bulbar vasomotor center
A76-40632
- AIR DEFENSE**
Ground observer ability to detect and estimate the range of jet aircraft flying over hilly terrain [AD-A020657]
N76-29914
- AIR TRAFFIC CONTROL**
Physiological, subjective, and performance correlates of reported boredom and monotony while performing a simulated radar control task [AD-A025426/8]
N76-29911
- AIRCRAFT ACCIDENT INVESTIGATION**
Making use of the laboratory in aerospace medicine
A76-38703
- AIRCRAFT CONTROL**
A study of handling quality assessment in manual control system
A76-39850
- AIRCRAFT DETECTION**
Ground observer ability to detect and estimate the range of jet aircraft flying over hilly terrain [AD-A020657]
N76-29914
- AIRCRAFT LANDING**
The effect of delay in the presentation of visual information on pilot performance [AD-A021418]
N76-29913
- AIRCRAFT PILOTS**
Behavior of some respiratory parameters in student pilots - A comparative study on two distinct groups examined ten years apart
A76-38702
- Investigation of pilot self-briefing techniques. Volume 1: Methodology, results, and recommendations [AD-A024645/4]
N76-29907
- ALDOSTERONE**
Plasma renin, angiotensin II, and plasma and urinary aldosterone in running exercise
A76-40886
- ALKALOSIS**
Alkaline shift in lumbar and intracranial CSF in man after 5 days at high altitude
A76-40890
- ALKANES**
Compartmentalization of amino acids in surfactant aggregates - Partitioning between water and aqueous micellar sodium dodecanoate and between hexane and dodecylammonium propionate trapped water in hexane
A76-40135
- ALTITUDE ACCLIMATIZATION**
Alkaline shift in lumbar and intracranial CSF in man after 5 days at high altitude
A76-40890
- ALVEOLAR AIR**
Role of diffusion in intrapulmonary mixing of gases
A76-40635
- Effect of pressure and composition of gaseous medium on PO₂ and PCO₂ gradients between mixed alveolar air and arterial blood
A76-40636
- Role of the alveolar ventilation/perfusion line in a periodically ventilated lung model
A76-40637
- AMINES**
Physiology of emotion --- Russian book
A76-39207
- AMINO ACIDS**
Compositional nonrandomness - A quantitatively conserved evolutionary invariant --- of protein amino acid sequences
A76-40128
- Compartmentalization of amino acids in surfactant aggregates - Partitioning between water and aqueous micellar sodium dodecanoate and between hexane and dodecylammonium propionate trapped water in hexane
A76-40135
- Aminoacyl transfer from an adenylate anhydride to polyribonucleotides
A76-40138
- Reactions of aminomalononitrile with electrophiles --- simulating prebiotic conditions
A76-40139
- Amino acid precursors in lunar fines - Limits to the contribution of jet exhaust
A76-41120
- The synthesis of specifically deuterated amino acids and peptides for use in biophysical studies
N76-28805
- AMMONIA**
Life and the outer planets. I - Performance of terrestrial organisms in ammonia-rich systems
A76-40985
- ANTARCTIC REGIONS**
Antarctic clothing [AD-A021714]
N76-29918
- ANXIETY**
Anxiety and performance - A study concerning the prediction of predictability
A76-39549
- AQUEOUS SOLUTIONS**
Compartmentalization of amino acids in surfactant aggregates - Partitioning between water and aqueous micellar sodium dodecanoate and between hexane and dodecylammonium propionate trapped water in hexane
A76-40135
- ARTERIES**
Investigation of the mechanical parameters of fine blood vessels
A76-40634
- Observations on autoregulation in skeletal muscle - The effects of arterial hypoxia
A76-41142
- AUDITORY SIGNALS**
Combining evidence presented simultaneously to the eye and the ear - A comparison of some predictive models
A76-38440
- AUTOMATIC CONTROL**
Application of statistical modeling to the investigation of the activity of the operator in man-machine automatic control system complexes
A76-40460
- AUTOMATION**
Definition of performance specifications for automated Analytical Electrophoresis Facility (AAEP) [NASA-CR-149957]
N76-29892
- AUTOMOBILE ACCIDENTS**
Evaluation of self-contained anthropomorphic dummy data acquisition system [PB-250722/6]
N76-28824
- AUTOMOBILES**
A study of handling quality assessment in manual control system
A76-39850
- B**
- BACK INJURIES**
A study on examination procedures for preventing traumatic and nontraumatic osteoarthropathies related to flying activities
A76-38701
- BACTERIA**
Method of detecting and counting bacteria [NASA-CASE-GSC-11917-2]
N76-29891
- BED REST**
Plasma vasopressin and renin activity in women exposed to bed rest and +G/z/ acceleration
A76-38803
- BIBLIOGRAPHIES**
Current awareness service for toxic substances (CATS). Cumulative report no. 1, Part 1 [PB-250074/2]
N76-28815
- Current awareness service for toxic substances (CATS). Cumulative report no. 1, Part 2 [PB-250075-9]
N76-28816
- BINOULAR VISION**
A multistable movement display - Evidence for two separate motion systems in human vision
A76-39548
- The significance of frequency gradients in binocular grating perception
A76-39685
- BIOACOUSTICS**
Bioacoustics --- Russian book
A76-40224
- BIOASSAY**
Cytochemical investigations of proteins and RNA in spinal motoneurons and neurons of spinal ganglia of the rat after space flight
A76-39577

- Method of detecting and counting bacteria
[NASA-CASE-GSC-11917-2] N76-29891
- BIOCHEMISTRY**
Life and the outer planets. I - Performance of
terrestrial organisms in ammonia-rich systems A76-40985
Life and the outer planets. II - Enzyme activity
in ammonia-water systems and other exotic media
at various temperatures A76-40986
- BIOCONTROL SYSTEMS**
Simulation of the respiratory control system
A76-40195
Control and modeling of physiological processes
--- Russian book A76-40627
Response of the hydrodynamically interacting
semicircular canals to an adequate stimulus A76-40628
Results of physical modeling of the system of
semicircular canals in man - Functioning of the
vestibular apparatus during oscillations of the
head A76-40629
Moments at joints during human walking and the
problem of maintaining equilibrium A76-40630
Investigation of the characteristics of muscle
control during stabilization and rhythmic activity
A76-40631
Observations on autoregulation in skeletal muscle
- The effects of arterial hypoxia A76-41142
- BIODYNAMICS**
Nonlinear diffusion models and spatial
interactions in biological systems N76-28806
- BIOELECTRIC POTENTIAL**
Evoked potentials and visual acuity A76-39687
- BIOELECTRICITY**
Investigation of cerebrospinal reflexes - A review
of the concept of bulbar vasomotor center A76-40632
Interactive graphics in the analysis of neuronal
spike train data A76-40712
Implantable electrode for recording nerve signals
in awake animals A76-40892
- BIOENGINEERING**
Hearing protectors for workers in energy plants
A76-40345
- BIOINSTRUMENTATION**
Measuring the magnetic fields of the human heart,
brain, muscles, and lungs A76-39710
Catheter tip force transducer for cardiovascular
research [NASA-CASE-NPO-13643-1] N76-29896
- BIOLOGICAL EFFECTS**
The biological effects of high-energy radiation
A76-38347
Microdosimetry and the effects of small doses of
radiation A76-38348
Biological evaluation of the toxicity of gases
produced under fire conditions by synthetic
materials. I - Methods and preliminary
experiments concerning the reaction of animals
to simple mixtures of air and carbon dioxide or
carbon monoxide A76-38619
Electromagnetic compatibility /EMC/ as a
determining factor in biological effects caused
by electric and magnetic fields A76-40757
Avoidance of radiation hazards from microwave
antennas A76-41124
- BIOLOGICAL EVOLUTION**
Compositional nonrandomness - A quantitatively
conserved evolutionary invariant --- of protein
amino acid sequences A76-40128
- BIOMASS ENERGY PRODUCTION**
Solar energy utilization in photosynthesis
A76-38316
- Experimental investigation of the physical
characteristics of the initial stage of
photosynthesis A76-40639
- BIOMEDICAL DATA**
Application of digital filtering and data
compression to biomedical signal processing and
telemetry A76-39727
Digital archiving of biomedical recordings for
off-line computer analysis A76-40713
- BIONICS**
Simulation of the respiratory control system
A76-40195
- BIOPHYSICS**
Control and modeling of physiological processes
--- Russian book A76-40627
Results of physical modeling of the system of
semicircular canals in man - Functioning of the
vestibular apparatus during oscillations of the
head A76-40629
Quantum electronic approach to study the initial
stage of photosynthesis A76-40638
Experimental investigation of the physical
characteristics of the initial stage of
photosynthesis A76-40639
A cooperative model for the first stage of
photosynthesis A76-40640
- BIOSATELLITES**
Space flight effects on the skeletal muscles of rats
A76-39576
Space flight effects on skeletal bones of rats -
Light and electron microscopic examination A76-39581
Space flight effects on the hemopoietic function
of bone marrow of the rat A76-39583
- BIOTELEMETRY**
Application of digital filtering and data
compression to biomedical signal processing and
telemetry A76-39727
Miniature ingestible telemeter devices to measure
deep-body temperature [NASA-CASE-ARC-10583-1] N76-29894
- BLEACHING**
Neutron diffraction studies of retinal rod outer
segment membranes A76-39009
- BLOOD**
Toxicity of components of plastic having contact
with blood [PB-251742/3] N76-29901
- BLOOD CIRCULATION**
Simultaneous measurement of cardiac output and its
distribution with microspheres in the rat A76-41143
- BLOOD COAGULATION**
Effects of exercise-induced stress on platelet
aggregation A76-40575
- BLOOD FLOW**
Resonance ultrasonic measurements of microscopic
gas bubbles --- in living tissue A76-39588
Hypothalamic and thalamic blood flow during
somatic afferent stimulation in dogs A76-40200
Investigation of the mechanical parameters of fine
blood vessels A76-40634
Observations on autoregulation in skeletal muscle
- The effects of arterial hypoxia A76-41142
- BLOOD PLASMA**
Glucagon and plasma catecholamines during
beta-receptor blockade in exercising man A76-38801
Plasma vasopressin and renin activity in women
exposed to bed rest and +G/z/ acceleration A76-38803

BLOOD PRESSURE

- Space flight effects on the hemopoietic function of bone marrow of the rat A76-39583
- Plasma renin, angiotensin II, and plasma and urinary aldosterone in running exercise A76-40886
- BLOOD PRESSURE**
Effect of angiotensin on hypoxic pulmonary vasoconstriction in isolated dog lung A76-40889
- BLUE GREEN ALGAE**
Kinetics of oxygen release from single-cell algae A76-40641
- BODY FLUIDS**
Method of detecting and counting bacteria [NASA-CASE-GSC-11917-2] N76-29891
- BODY KINEMATICS**
Moments at joints during human walking and the problem of maintaining equilibrium A76-40630
- BODY MEASUREMENT (BIOLOGY)**
Behavior of some respiratory parameters in student pilots - A comparative study on two distinct groups examined ten years apart A76-38702
- BODY TEMPERATURE**
Effects of electrical stimulation in the lower brainstem on temperature regulation in the unanaesthetized guinea-pig A76-41201
- Responses of midbrain raphe neurons to local temperature A76-41202
- Miniature ingestible telemeter devices to measure deep-body temperature [NASA-CASE-ARC-10583-1] N76-29894
- BONE MARROW**
Space flight effects on the hemopoietic function of bone marrow of the rat A76-39583
- BONES**
Space flight effects on skeletal bones of rats - Light and electron microscopic examination A76-39581
- BOREDOM**
Physiological, subjective, and performance correlates of reported boredom and monotony while performing a simulated radar control task [AD-A025426/8] N76-29911
- BRAIN**
Responses of midbrain raphe neurons to local temperature A76-41202
- Central neural mechanisms governing postural cardiovascular mechanisms [NASA-CR-148603] N76-29898
- BRAIN CIRCULATION**
Hypothalamic and thalamic blood flow during somatic afferent stimulation in dogs A76-40200
- BRAIN STEM**
Effects of electrical stimulation in the lower brainstem on temperature regulation in the unanaesthetized guinea-pig A76-41201
- BREATHING**
Role of diffusion in intrapulmonary mixing of gases A76-40635
- BURNS (INJURIES)**
Psychical disturbances in cases of burns caused by electric current A76-40344

C

- CAPILLARIES (ANATOMY)**
Investigation of the mechanical parameters of fine blood vessels A76-40634
- CARBOHYDRATE METABOLISM**
Glucagon and plasma catecholamines during beta-receptor blockade in exercising man A76-38801

SUBJECT INDEX

- CARBON DIOXIDE**
Biological evaluation of the toxicity of gases produced under fire conditions by synthetic materials. I - Methods and preliminary experiments concerning the reaction of animals to simple mixtures of air and carbondioxide or carbonmonoxide A76-38619
- Kinetics of oxygen release from single-cell algae A76-40641
- CARBON DIOXIDE TENSION**
Effect of pressure and composition of gaseous medium on PO₂ and pCO₂ gradients between mixed alveolar air and arterial blood A76-40636
- CARBON MONOXIDE**
Biological evaluation of the toxicity of gases produced under fire conditions by synthetic materials. I - Methods and preliminary experiments concerning the reaction of animals to simple mixtures of air and carbondioxide or carbonmonoxide A76-38619
- Closed system Fischer-Tropsch synthesis over meteoritic iron, iron ore and nickel-iron alloy --- deuterium-carbon monoxide reaction catalysis A76-39397
- CARBON TETRACHLORIDE**
Criteria for a recommended standard. Occupational exposure to carbon tetrachloride [PB-250424/9] N76-28817
- CARCINOGENS**
Interactions of carcinogens with human cell DNA: Damage and Repair [CONF-750745-1] N76-29900
- CARDIAC VENTRICLES**
Orthogonal electrocardiogram, apex cardiogram, and atrial sound in normotensive and hypertensive 50-year-old men A76-38930
- Systolic time intervals during +Gz acceleration A76-40887
- CARDIOGRAPHY**
X-ray 3-D coded aperture imaging - Displaying the heart A76-39757
- Simultaneous measurement of cardiac output and its distribution with microspheres in the rat A76-41143
- CARDIOLOGY**
Changes in clinical cardiologic measurements associated with high +Gz/ stress A76-39580
- On the detection of the magnetic heart vector - An application of the reciprocity theorem A76-40111
- Myocardium wall thickness transducer and measuring method [NASA-CASE-NPO-13644-1] N76-29895
- CARDIOVASCULAR SYSTEM**
Cardiovascular function during sustained +Gz/ stress A76-39584
- X-ray 3-D coded aperture imaging - Displaying the heart A76-39757
- Investigation of cerebrospinal reflexes - A review of the concept of bulbar vasomotor center A76-40632
- Investigation of causes of orthostatic instability A76-40633
- Simultaneous measurement of cardiac output and its distribution with microspheres in the rat A76-41143
- Effects of abrupt time zone change on some circadian rhythms in man [NASA-TT-F-17117] N76-28813
- Catheter tip force transducer for cardiovascular research [NASA-CASE-NPO-13643-1] N76-29896
- Central neural mechanisms governing postural cardiovascular mechanisms [NASA-CR-148603] N76-29898
- CATALYSIS**
Closed system Fischer-Tropsch synthesis over meteoritic iron, iron ore and nickel-iron alloy --- deuterium-carbon monoxide reaction catalysis A76-39397

SUBJECT INDEX

CYANOGEN

- Aminoacyl transfer from an adenylate anhydride to polypribonucleotides
A76-40138
- CATECHOLAMINE**
Glucagon and plasma catecholamines during beta-receptor blockade in exercising man
A76-38801
Tissue catecholamine levels of the golden hamster /Mesocricetus auratus/ acclimated to 7, 22 and 34 C
A76-40947
- CATHETERIZATION**
Catheter tip force transducer for cardiovascular research
[NASA-CASE-WPO-13643-1]
N76-29896
- CELLS (BIOLOGY)**
Interactions of carcinogens with human cell DNA: Damage and Repair
[CONF-750745-1]
N76-29900
- CENTRAL NERVOUS SYSTEM**
Electromagnetic field effects in nerve tissue
A76-40752
- CENTRIFUGING STRESS**
Cardiac pathology associated with high sustained +G/z/. II - Stress cardiomyopathy
A76-39579
- CEREBROSPINAL FLUID**
Alkaline shift in lumbar and intracranial CSF in man after 5 days at high altitude
A76-40890
- CHEMICAL COMPOUNDS**
Current awareness service for toxic substances (CATS). Cumulative report no. 1, Part 1
[PB-250074/2]
N76-28815
Current awareness service for toxic substances (CATS). Cumulative report no. 1, Part 2
[PB-250075-9]
N76-28816
- CHEMICAL REACTIONS**
Prebiotic peptide-formation in the solid state. III - Condensation reactions of glycine in solid state mixtures containing inorganic polyphosphates
A76-40133
The prebiotic synthesis of deoxythymidine oligonucleotides. II - Comparison of condensing agents
A76-40134
On the possible role of organic melanoidin polymers as matrices for prebiotic activity
A76-40137
Reactions of aminomalononitrile with electrophiles --- simulating prebiotic conditions
A76-40139
- CHEMORECEPTORS**
Glucagon and plasma catecholamines during beta-receptor blockade in exercising man
A76-38801
- CIRCADIAN RHYTHMS**
Effects of time zone changes on performance and physiology of airline personnel
A76-39586
Jet lag isn't just a state of mind --- prolonged flight effects on circadian dysrhythmia
A76-40127
Nocturnal lowering of thresholds for sweating and vasodilation
A76-40885
Effects of abrupt time zone change on some circadian rhythms in man
[NASA-TT-P-17117]
N76-28813
- CITRATES**
Renal handling of citrate during heat-induced hypocitricemia
A76-40198
- COCKPITS**
Effect of pre-adapting spectral stimuli on visual responses --- aircrew reactions to cockpit display design
A76-39582
- COGNITIVE PSYCHOLOGY**
Combining evidence presented simultaneously to the eye and the ear - A comparison of some predictive models
A76-38440
Motion constancy dependent upon perceived distance and the spatial frequency of the stimulus pattern
A76-38441
- Learning in the case of aversion-related signal concepts under conditions of avoidance and nonavoidance of the aversive situation
A76-39550
- Motion information in iconic memory
A76-41321
- Effect of information feedback upon intertrial consistency of time judgment
A76-41322
- COLD ACCLIMATIZATION**
Metabolic adaptations in brown adipose tissue of the hamster in extreme ambient temperatures
A76-40199
Tissue catecholamine levels of the golden hamster /Mesocricetus auratus/ acclimated to 7, 22 and 34 C
A76-40947
- COLD WEATHER**
Antarctic clothing
[AD-A021714]
N76-29918
- COMBUSTION PRODUCTS**
Biological evaluation of the toxicity of gases produced under fire conditions by synthetic materials. I - Methods and preliminary experiments concerning the reaction of animals to simple mixtures of air and carbondioxide or carbonmonoxide
A76-38619
- COMPUTER GRAPHICS**
Interactive graphics in the analysis of neuronal spike train data
A76-40712
- COMPUTER PROGRAMS**
Continuation of advanced crew procedures development techniques
[NASA-CR-147843]
N76-29909
- COMPUTER TECHNIQUES**
Digital archiving of biomedical recordings for off-line computer analysis
A76-40713
- COMPUTERIZED SIMULATION**
Simulation of the respiratory control system
A76-40195
- CONDITIONING (LEARNING)**
Learning in the case of aversion-related signal concepts under conditions of avoidance and nonavoidance of the aversive situation
A76-39550
- CONFERENCES**
Course on High Energy Radiation Dosimetry and Protection, 1st, International School of Radiation Damage and Protection, Erice, Italy, October 1-10, 1975, Proceedings
A76-38343
- CONTROL SIMULATION**
Simulation of the respiratory control system
A76-40195
- CONTROL THEORY**
Toward a respirator control system
N76-28818
- CORONARY ARTERY DISEASE**
Effects of exercise-induced stress on platelet aggregation
A76-40575
- CORONARY CIRCULATION**
Cardiovascular function during sustained +G/z/ stress
A76-39584
- CRASH INJURIES**
Making use of the laboratory in aerospace medicine
A76-38703
- CRYSTALLIZATION**
Crystallization and solid-state reaction as a route to asymmetric synthesis from achiral starting materials
A76-40131
- CYANAMIDES**
The prebiotic synthesis of deoxythymidine oligonucleotides. II - Comparison of condensing agents
A76-40134
- CYANIDES**
Amino acid precursors in lunar fines - Limits to the contribution of jet exhaust
A76-41120
- CYANOGEN**
Cyanogen induced phosphorylation of D-fructose --- prebiotic modeling
A76-40129

CYTOLOGY

SUBJECT INDEX

CYTOLOGY

Cytochemical investigations of proteins and RNA in spinal motoneurons and neurons of spinal ganglia of the rat after space flight

A76-39577

D

DARK ADAPTATION

Neutron diffraction studies of retinal rod outer segment membranes

A76-39009

DATA ACQUISITION

Evaluation of self-contained anthropomorphic dummy data acquisition system
[PB-250722/6]

N76-28824

DATA COMPRESSION

Application of digital filtering and data compression to biomedical signal processing and telemetry

A76-39727

DATA RECORDING

Digital archiving of biomedical recordings for off-line computer analysis

A76-40713

DC 10 AIRCRAFT

Chemically generated supplemental oxygen systems in DC-10 and L-1011 aircraft --- a performance prediction and evaluation
[PB-252023/7]

N76-29916

DECOMPRESSION SICKNESS

Application of hyperbaric oxygen therapy in a case of prolonged cerebral hypoxia following rapid decompression

A76-39585

DELAY

The effect of delay in the presentation of visual information on pilot performance
[AD-A021418]

N76-29913

DEOXYRIBONUCLEIC ACID

Interactions of carcinogens with human cell DNA: Damage and Repair
[CONF-750745-1]

N76-29900

DEUTERIUM

Closed system Fischer-Tropsch synthesis over meteoritic iron, iron ore and nickel-iron alloy --- deuterium-carbon monoxide reaction catalysis

A76-39397

The synthesis of specifically deuterated amino acids and peptides for use in biophysical studies

N76-28805

DIAGNOSIS

Diagnostic application of microwave radiation

N76-28810

DIGITAL FILTERS

Application of digital filtering and data compression to biomedical signal processing and telemetry

A76-39727

DISPLAY DEVICES

Effect of pre-adapting spectral stimuli on visual responses --- aircrew reactions to cockpit display design

A76-39582

DOSIMETERS

Course on High Energy Radiation Dosimetry and Protection, 1st, International School of Radiation Damage and Protection, Erice, Italy, October 1-10, 1975, Proceedings

A76-38343

Dosimetry during space missions

A76-38346

Microdosimetry and the effects of small doses of radiation

A76-38348

DYNAMIC MODELS

Nonlinear diffusion models and spatial interactions in biological systems

N76-28806

Modeling of intelligent behavior
[NASA-TT-P-17126]

N76-29910

E

EAR

Acute changes in animal inner ears due to simulated sonic booms

A76-38990

EAR PROTECTORS

Hearing protectors for workers in energy plants

A76-40345

Earplug rankings based on the Protector-Attenuation Rating (P-AR)
[AD-A024756/9]

N76-28821

Personal hearing protective devices, fitting, care, and use
[AD-A021408]

N76-28825

EDUCATION

An evaluation of the effectiveness of the FAA management training school
[AD-A025254/4]

N76-29908

EFFECTIVE NERVOUS SYSTEMS

Implantable electrode for recording nerve signals in awake animals

A76-40892

EJECTION INJURIES

A study on examination procedures for preventing traumatic and nontraumatic osteoarthropathies related to flying activities

A76-38701

ELECTRIC CURRENT

Psychical disturbances in cases of burns caused by electric current

A76-40344

ELECTRIC STIMULI

Effects of electrical stimulation in the lower brainstem on temperature regulation in the unanaesthetized guinea-pig

A76-41201

ELECTROCARDIOGRAPHY

Orthogonal electrocardiogram, apex cardiogram, and atrial sound in normotensive and hypertensive 50-year-old men

A76-38930

ELECTROENCEPHALOGRAPHY

Measuring the magnetic fields of the human heart, brain, muscles, and lungs

A76-39710

ELECTROMAGNETIC ABSORPTION

Long-wavelength analysis of electromagnetic power absorption by prolate spheroidal and ellipsoidal models of man

N76-28812

ELECTROMAGNETIC COMPATIBILITY

Electromagnetic compatibility /EMC/ as a determining factor in biological effects caused by electric and magnetic fields

A76-40757

ELECTROMAGNETIC FIELDS

Electromagnetic field effects in nerve tissue

A76-40752

Effects of extremely low frequency electromagnetic fields on Physarum polycephalum
[AD-A021457]

N76-29893

ELECTROMYOGRAPHY

Investigation of the characteristics of muscle control during stabilization and rhythmic activity

A76-40631

ELECTRON MICROSCOPES

Space flight effects on skeletal bones of rats - Light and electron microscopic examination

A76-39581

ELECTROPHORESIS

Definition of performance specifications for automated Analytical Electrophoresis Facility (AAEF)

N76-29892

ELECTRORETINOGRAPHY

Effect of pre-adapting spectral stimuli on visual responses --- aircrew reactions to cockpit display design

A76-39582

EMOTIONS

Physiology of emotion --- Russian book

A76-39207

EMPHYSEMA

Diagnostic application of microwave radiation

N76-28810

ENERGY TECHNOLOGY

Solar energy utilization in photosynthesis

A76-38316

ENVIRONMENT EFFECTS

Renal handling of citrate during heat-induced hypocitricemia

A76-40198

ENZYME ACTIVITY

- Plasma vasopressin and renin activity in women exposed to bed rest and +G/z/ acceleration A76-38803
- Plasma renin, angiotensin II, and plasma and urinary aldosterone in running exercise A76-40886
- Effect of angiotensin on hypoxic pulmonary vasoconstriction in isolated dog lung A76-40889
- Life and the outer planets. II - Enzyme activity in ammonia-water systems and other exotic media at various temperatures A76-40986

ENZYMES

- On the possible role of organic melanoidin polymers as matrices for prebiotic activity A76-40137
- Enzymes in heterogeneous systems N76-28804

EPINEPHRINE

- Tissue catecholamine levels of the golden hamster *Mesocricetus auratus*/ acclimated to 7, 22 and 34 C A76-40947

ERYTHROCYTES

- Drug/receptor interactions: The example of the cardiac glycoside receptor of the erythrocyte membrane [NASA-TT-F-17151] N76-28814

ESCHERICHIA

- Two techniques for eliminating luminol interference material and flow system configurations for luminol and firefly luciferase systems [NASA-CR-144768] N76-28808

ETHYL ALCOHOL

- Influence of socially used drugs on vision and vision performance [AD-A022024] N76-29905

EVALUATION

- Chemically generated supplemental oxygen systems in DC-10 and L-1011 aircraft --- a performance prediction and evaluation [PB-252023/7] N76-29916

EVOKED RESPONSE (PSYCHOPHYSIOLOGY)

- Evoked potentials and visual acuity A76-39687

EXO BIOLOGY

- Life and the outer planets. I - Performance of terrestrial organisms in ammonia-rich systems A76-40985
- Life and the outer planets. II - Enzyme activity in ammonia-water systems and other exotic media at various temperatures A76-40986

EXTRATERRESTRIAL LIFE

- Life and the outer planets. II - Enzyme activity in ammonia-water systems and other exotic media at various temperatures A76-40986

EXTREMELY LOW FREQUENCIES

- Effects of extremely low frequency electromagnetic fields on *Physarum polycephalum* [AD-A021457] N76-29893

EYE (ANATOMY)

- The measurement of threshold temperatures in the ocular fundus for laser induced, visible lesions N76-28811

F**FAST FOURIER TRANSFORMATIONS**

- A new method to determine frequency characteristics of the respiratory system A76-40891

FEEDBACK

- Effect of information feedback upon intertrial consistency of time judgment A76-41322

FEEDBACK CONTROL

- A study of handling quality assessment in manual control system A76-39850

FLIGHT CREWS

- Operational stress and higher psychic functions - Observations on flight crews and parachutists in various phases of a parachute jump mission A76-38704

Verification of hemostasis disorders in air force personnel A76-38705

Psychotherapy and return to flying duties A76-39587

FLIGHT FATIGUE

Jet lag isn't just a state of mind --- prolonged flight effects on circadian dysrhythmia A76-40127

FLIGHT FITNESS

Psychotherapy and return to flying duties A76-39587

FLIGHT SIMULATORS

Integration of visual and motion cues for simulator requirements and ride quality investigation [NASA-CR-148479] N76-28819

FLIGHT STRESS (BIOLOGY)

Making use of the laboratory in aerospace medicine A76-38703

Notes on flight-related psychosyndromes, in particular phobic syndromes A76-38707

Jet lag isn't just a state of mind --- prolonged flight effects on circadian dysrhythmia A76-40127

FLUIDICS

Fluidic Sensors for life support systems [AD-A022016] N76-29919

FLYING PERSONNEL

A study on examination procedures for preventing traumatic and nontraumatic osteoarthropathies related to flying activities A76-38701

Motivational problems in candidate pilots A76-38706

Effects of time zone changes on performance and physiology of airline personnel A76-39586

FORCED VIBRATION

A new method to determine frequency characteristics of the respiratory system A76-40891

FOVEA

The influence of selective attention in peripheral and foveal vision A76-38444

FUNGI

Natural history of agaricines --- taxonomy and morphology of fungi [NASA-TT-F-16514] N76-28807

Effects of extremely low frequency electromagnetic fields on *Physarum polycephalum* [AD-A021457] N76-29893

G**GAS DETECTORS**

Monitoring spacecraft atmosphere contaminants by laser absorption spectroscopy [NASA-CR-148481] N76-28820

Fluidic Sensors for life support systems [AD-A022016] N76-29919

GAS EXCHANGE

Effect of pressure and composition of gaseous medium on PO₂ and pCO₂ gradients between mixed alveolar air and arterial blood A76-40636

Role of the alveolar ventilation/perfusion line in a periodically ventilated lung model A76-40637

GAS MIXTURES

Biological evaluation of the toxicity of gases produced under fire conditions by synthetic materials. I - Methods and preliminary experiments concerning the reaction of animals to simple mixtures of air and carbondioxide or carbonmonoxide A76-38619

GASBOUS DIFFUSION

Role of diffusion in intrapulmonary mixing of gases A76-40635

GENETIC CODE

Compositional nonrandomness - A quantitatively conserved evolutionary invariant --- of protein amino acid sequences A76-40128

GEOCHEMISTRY

SUBJECT INDEX

GEOCHEMISTRY

- Amino acid precursors in lunar fines - Limits to the contribution of jet exhaust A76-41120
- GLUCOSIDES**
Drug/receptor interactions: The example of the cardiac glycoside receptor of the erythrocyte membrane [NASA-TT-P-17151] N76-28814
- GLYCINE**
Prebiotic peptide-formation in the solid state. II - Reaction of glycine with adenosine 5 prime-triphosphate and P₁, P₂-diadenosine-pyrophosphate A76-40132
- Prebiotic peptide-formation in the solid state. III - Condensation reactions of glycine in solid state mixtures containing inorganic polyphosphates A76-40133
- GRATINGS (SPECTRA)**
Perceptual latencies to sinusoidal gratings A76-39684
- The significance of frequency gradients in binocular grating perception A76-39685
- Spatial pooling properties deduced from the detectability of FM and quasi-AM gratings - A reanalysis --- visual pattern detection A76-39688

H

- HADRONS**
The biological effects of high-energy radiation A76-38347
- HEAD MOVEMENT**
The constancy of the orientation of the visual field A76-38442
- Results of physical modeling of the system of semicircular canals in man - Functioning of the vestibular apparatus during oscillations of the head A76-40629
- HEALTH PHYSICS**
Course on High Energy Radiation Dosimetry and Protection, 1st, International School of Radiation Damage and Protection, Erice, Italy, October 1-10, 1975, Proceedings A76-38343
- Electromagnetic compatibility /EMC/ as a determining factor in biological effects caused by electric and magnetic fields A76-40757
- HEART DISEASES**
Cardiac pathology associated with high sustained +G/z/. I - Subendocardial hemorrhage A76-39578
- HEART FUNCTION**
Cardiovascular function during sustained +G/z/ stress A76-39584
- Simultaneous measurement of cardiac output and its distribution with microspheres in the rat A76-41143
- HEART RATE**
Systolic time intervals during +Gz acceleration A76-40887
- HEAT ACCLIMATIZATION**
Metabolic adaptations in brown adipose tissue of the hamster in extreme ambient temperatures A76-40199
- Tissue catecholamine levels of the golden hamster /Mesocricetus auratus/ acclimated to 7, 22 and 34 C A76-40947
- HEAT TOLERANCE**
Mental and perceptual performance in heat [PB-251439/6] N76-29915
- HEMATOPOIETIC SYSTEM**
Space flight effects on the hemopoietic function of bone marrow of the rat A76-39582
- HEMODYNAMIC RESPONSES**
Verification of hemostasis disorders in air force personnel A76-38705
- Systolic time intervals during +Gz acceleration A76-40887
- Simultaneous measurement of cardiac output and its distribution with microspheres in the rat A76-41143
- HEMORRHAGES**
Cardiac pathology associated with high sustained +G/z/. I - Subendocardial hemorrhage A76-39578
- HEMOSTATICS**
Verification of hemostasis disorders in air force personnel A76-38705
- HETEROGENEITY**
Enzymes in heterogeneous systems N76-28804
- HIGH ENERGY INTERACTIONS**
Course on High Energy Radiation Dosimetry and Protection, 1st, International School of Radiation Damage and Protection, Erice, Italy, October 1-10, 1975, Proceedings A76-38343
- The biological effects of high-energy radiation A76-38347
- HIGH GRAVITY ENVIRONMENTS**
Changes in clinical cardiologic measurements associated with high +G/z/ stress A76-39580
- HORMONE METABOLISMS**
Physiology of emotion --- Russian book A76-39207
- HUMAN BEHAVIOR**
Motivational problems in candidate pilots A76-38706
- Notes on flight-related psychosyndromes, in particular phobic syndromes A76-38707
- Physiology of emotion --- Russian book A76-39207
- HUMAN BODY**
Research on construction of a statistical model for predicting impact acceleration injury [AD-A021669] N76-29904
- HUMAN FACTORS ENGINEERING**
Effect of pre-adapting spectral stimuli on visual responses --- aircrew reactions to cockpit display design A76-39582
- A study of handling quality assessment in manual control system A76-39850
- Evaluation of self-contained anthropomorphic dummy data acquisition system [PB-250722/6] N76-28824
- HUMAN PATHOLOGY**
Making use of the laboratory in aerospace medicine A76-38703
- Verification of hemostasis disorders in air force personnel A76-38705
- Changes in clinical cardiologic measurements associated with high +G/z/ stress A76-39580
- Psychical disturbances in cases of burns caused by electric current A76-40344
- HUMAN PERFORMANCE**
Anxiety and performance - A study concerning the prediction of predictability A76-39549
- Structure and properties of a single channel in the human visual system A76-39683
- Effect of information feedback upon intertrial consistency of time judgment A76-41322
- Physiological, subjective, and performance correlates of reported boredom and monotony while performing a simulated radar control task [AD-A025426/8] N76-29911
- Mental and perceptual performance in heat [PB-251439/6] N76-29915
- HUMAN REACTIONS**
Influence of socially used drugs on vision and vision performance [AD-A022024] N76-29905
- HUMAN TOLERANCES**
Long-wavelength analysis of electromagnetic power absorption by prolate spheroidal and ellipsoidal models of man N76-28812

HYDROGEN PEROXIDE

Two techniques for eliminating luminol interference material and flow system configurations for luminol and firefly luciferase systems
[NASA-CR-144768] N76-28808

HYDROGEN-BASED ENERGY

Solar energy utilization in photosynthesis
A76-38316

HYDROLYSIS

Cyanogen induced phosphorylation of D-fructose --- prebiotic modeling
A76-40129

HYPERBARIC CHAMBERS

Application of hyperbaric oxygen therapy in a case of prolonged cerebral hypoxia following rapid decompression
A76-39585

HYPERCAPNIA

Threshold temperatures for shivering in acute and chronic hypercapnia
A76-40888

HYPERTENSION

Orthogonal electrocardiogram, apex cardiogram, and atrial sound in normotensive and hypertensive 50-year-old men
A76-38930

HYPERVENTILATION

Respiratory and other responses in subjects immersed in cold water
A76-38802

HYPOTHALAMUS

Hypothalamic and thalamic blood flow during somatic afferent stimulation in dogs
A76-40200

HYPOTONIA

Investigation of the mechanical parameters of fine blood vessels
A76-40634

HYPOXIA

Application of hyperbaric oxygen therapy in a case of prolonged cerebral hypoxia following rapid decompression
A76-39585
Effect of angiotensin on hypoxic pulmonary vasoconstriction in isolated dog lung
A76-40889
Alkaline shift in lumbar and intracranial CSF in man after 5 days at high altitude
A76-40890
Observations on autoregulation in skeletal muscle - The effects of arterial hypoxia
A76-41142

IMAGE CONTRAST

Visual detection of patterns periodic in two dimensions
A76-39686

IMAGING TECHNIQUES

X-ray 3-D coded aperture imaging - Displaying the heart
A76-39757

IMPACT ACCELERATION

Research on construction of a statistical model for predicting impact acceleration injury
[AD-A021669] N76-29904

IMPACT PREDICTION

Research on construction of a statistical model for predicting impact acceleration injury
[AD-A021669] N76-29904

IMPLANTED ELECTRODES (BIOLOGY)

Implantable electrode for recording nerve signals in awake animals
A76-40892

IN-FLIGHT MONITORING

Monitoring spacecraft atmosphere contaminants by laser absorption spectroscopy
[NASA-CR-148481] N76-28820

INDUSTRIAL SAFETY

Criteria for a recommended standard. Occupational exposure to carbon tetrachloride
[PB-250424/9] N76-28817
Personal hearing protective devices, fitting, care, and use
[AD-A021408] N76-28825

INJURIES

Research on construction of a statistical model for predicting impact acceleration injury
[AD-A021669] N76-29904

INSECTS

Two techniques for eliminating luminol interference material and flow system configurations for luminol and firefly luciferase systems
[NASA-CR-144768] N76-28808

INTELLIGENCE

Modeling of intelligent behavior
[NASA-TT-F-17126] N76-29910

INTRACRANIAL CAVITY

Alkaline shift in lumbar and intracranial CSF in man after 5 days at high altitude
A76-40890

IRON ALLOYS

Closed system Fischer-Tropsch synthesis over meteoritic iron, iron ore and nickel-iron alloy --- deuterium-carbon monoxide reaction catalysis
A76-39397

IRON ORES

Closed system Fischer-Tropsch synthesis over meteoritic iron, iron ore and nickel-iron alloy --- deuterium-carbon monoxide reaction catalysis
A76-39397

ISOMERIZATION

On the origin of molecular 'handedness' in living systems --- paleomagnetic effects in prebiotic enantiomer synthesis
A76-40130

JET EXHAUST

Amino acid precursors in lunar fines - Limits to the contribution of jet exhaust
A76-41120

JOINTS (ANATOMY)

Moments at joints during human walking and the problem of maintaining equilibrium
A76-40630

JUDGMENTS

Effect of information feedback upon intertrial consistency of time judgment
A76-41322

L-1011 AIRCRAFT

Chemically generated supplemental oxygen systems in DC-10 and L-1011 aircraft --- a performance prediction and evaluation
[PB-252023/7] N76-29916

LASER APPLICATIONS

Monitoring spacecraft atmosphere contaminants by laser absorption spectroscopy
[NASA-CR-148481] N76-28820

LASER DAMAGE

The measurement of threshold temperatures in the ocular fundus for laser induced, visible lesions
N76-28811

LEG (ANATOMY)

Moments at joints during human walking and the problem of maintaining equilibrium
A76-40630

LIFE SUPPORT SYSTEMS

Development of two new oxygen self-rescuers
[PB-250809/1] N76-28823
Fluidic Sensors for life support systems
[AD-A022016] N76-29919

LIMBS (ANATOMY)

Investigation of causes of orthostatic instability
A76-40633

LOCOMOTION

Moments at joints during human walking and the problem of maintaining equilibrium
A76-40630

LONG WAVE RADIATION

Long-wavelength analysis of electromagnetic power absorption by prolate spheroidal and ellipsoidal models of man
N76-28812

LUMBAR REGION

Alkaline shift in lumbar and intracranial CSF in man after 5 days at high altitude
A76-40890

LUMINESCENCE

SUBJECT INDEX

LUMINESCENCE

Two techniques for eliminating luminol interference material and flow system configurations for luminol and firefly luciferase systems
[NASA-CR-144768] N76-28808

LUNAR MODULE

Amino acid precursors in lunar fines - Limits to the contribution of jet exhaust A76-41120

LUNAR SOIL

Amino acid precursors in lunar fines - Limits to the contribution of jet exhaust A76-41120

LUNGS

Measuring the magnetic fields of the human heart, brain, muscles, and lungs A76-39710

Role of the alveolar ventilation/perfusion line in a periodically ventilated lung model A76-40637

Effects of oxidant and sulfate interaction on production of lung lesions
[PB-251729/0] N76-29902

M

MAGNETIC EFFECTS

On the origin of molecular 'handedness' in living systems --- paleomagnetic effects in prebiotic enantiomer synthesis A76-40130

MAGNETIC RECORDING

Digital archiving of biomedical recordings for off-line computer analysis A76-40713

MAGNETITE

On the origin of molecular 'handedness' in living systems --- paleomagnetic effects in prebiotic enantiomer synthesis A76-40130

MAGNETOCARDIOGRAPHY

Measuring the magnetic fields of the human heart, brain, muscles, and lungs A76-39710

On the detection of the magnetic heart vector - An application of the reciprocity theorem A76-40111

MAGNETOMETERS

Measuring the magnetic fields of the human heart, brain, muscles, and lungs A76-39710

MAISONITRILE

Reactions of aminomalononitrile with electrophiles --- simulating prebiotic conditions A76-40139

MAN MACHINE SYSTEMS

A study of handling quality assessment in manual control system A76-39850

Application of statistical modeling to the investigation of the activity of the operator in man-machine automatic control system complexes A76-40460

Interactive graphics in the analysis of neuronal spike train data A76-40712

MANAGEMENT METHODS

An evaluation of the effectiveness of the FAA management training school
[AD-A025254/4] N76-29908

MANIPULATORS

Canadian remote manipulator system for NASA Space Shuttle A76-39714

MANUAL CONTROL

A study of handling quality assessment in manual control system A76-39850

MARIJUANA

Influence of socially used drugs on vision and vision performance
[AD-A022024] N76-29905

MATHEMATICAL MODELS

Application of statistical modeling to the investigation of the activity of the operator in man-machine automatic control system complexes A76-40460

Control and modeling of physiological processes
--- Russian book A76-40627

MECHANICAL PROPERTIES

Investigation of the mechanical parameters of fine blood vessels A76-40634

MELANOIDIN

On the possible role of organic melanoidin polymers as matrices for prebiotic activity A76-40137

MEMBRANE STRUCTURES

Neutron diffraction studies of retinal rod outer segment membranes A76-39009

MEMORY

Motion information in iconic memory A76-41321

The effects of adaptation to stereoscopic depth and to unocular image magnification on the duration of short-term visual storage A76-41324

MENSTRUATION

Effects of time zone changes on performance and physiology of airline personnel A76-39586

MENTAL PERFORMANCE

Modeling of intelligent behavior
[NASA-TT-P-17126] N76-29910

Mental and perceptual performance in heat
[PB-251439/6] N76-29915

METABOLISM

Metabolic adaptations in brown adipose tissue of the hamster in extreme ambient temperatures A76-40199

METROLOGICAL SERVICES

Investigation of pilot self-briefing techniques. Volume 1: Methodology, results, and recommendations
[AD-A024645/4] N76-29907

MICROWAVE ANTENNAS

Avoidance of radiation hazards from microwave antennas A76-41124

MICROWAVE RESONANCE

Diagnostic application of microwave radiation N76-28810

MINIATURE ELECTRONIC EQUIPMENT

Miniature ingestible telemeter devices to measure deep-body temperature
[NASA-CASE-ARC-10583-1] N76-29894

MITOCHONDRIA

Renal handling of citrate during heat-induced hypocitricemia A76-40198

MOLECULAR BIOLOGY

Compositional nonrandomness - A quantitatively conserved evolutionary invariant --- of protein amino acid sequences A76-40128

On the origin of molecular 'handedness' in living systems --- paleomagnetic effects in prebiotic enantiomer synthesis A76-40130

Crystallization and solid-state reaction as a route to asymmetric synthesis from achiral starting materials A76-40131

MONOCULAR VISION

A multistable movement display - Evidence for two separate motion systems in human vision A76-39548

The effects of adaptation to stereoscopic depth and to unocular image magnification on the duration of short-term visual storage A76-41324

MONOSACCHARIDES

Cyanogen induced phosphorylation of D-fructose --- prebiotic modeling A76-40129

MONOTONY

Physiological, subjective, and performance correlates of reported boredom and monotony while performing a simulated radar control task
[AD-A025426/8] N76-29911

MORPHOLOGY

Natural history of agaricines --- taxonomy and morphology of fungi
[NASA-TT-P-16514] N76-28807

MOTION PERCEPTION

Motion constancy dependent upon perceived distance and the spatial frequency of the stimulus pattern
A76-38441

Induced subject-relative movement - Persistence of apparent movement of a stationary point after removal of inducing stimulus
A76-38443

A multistable movement display - Evidence for two separate motion systems in human vision
A76-39548

Motion information in iconic memory
A76-41321

Tracking: An approach to dynamic vision and hand-eye coordination
[AD-A021674]
N76-29917

MULTIPROCESSING (COMPUTERS)

Interactive graphics in the analysis of neuronal spike train data
A76-40712

MUSCULAR FUNCTION

Space flight effects on the skeletal muscles of rats
A76-39576

MUSCULOSKELETAL SYSTEM

Space flight effects on the skeletal muscles of rats
A76-39576

Space flight effects on skeletal bones of rats - Light and electron microscopic examination
A76-39581

Investigation of the characteristics of muscle control during stabilization and rhythmic activity
A76-40631

Investigation of causes of orthostatic instability
A76-40633

Observations on autoregulation in skeletal muscle - The effects of arterial hypoxia
A76-41142

MUTATIONS

Recovery during radiation and chemical mutagenesis
N76-28809

MYOCARDIAL INFARCTION

Effects of exercise-induced stress on platelet aggregation
A76-40575

MYOCARDIUM

Cardiac pathology associated with high sustained +G/z/. I - Subendocardial hemorrhage
A76-39578

Cardiac pathology associated with high sustained +G/z/. II - Stress cardiomyopathy
A76-39579

Myocardium wall thickness transducer and measuring method
[NASA-CASE-NPO-13644-1]
N76-29895

MYOELECTRIC POTENTIALS

Measuring the magnetic fields of the human heart, brain, muscles, and lungs
A76-39710

N**NASA PROGRAMS**

Canadian remote manipulator system for NASA Space Shuttle
A76-39714

NEURAL NETS

Cytochemical investigations of proteins and RNA in spinal motoneurons and neurons of spinal ganglia of the rat after space flight
A76-39577

NEUROLOGY

Implantable electrode for recording nerve signals in awake animals
A76-40892

NEURONS

Investigation of cerebrospinal reflexes - A review of the concept of bulbar vasomotor center
A76-40632

Electromagnetic field effects in nerve tissue
A76-40752

Responses of midbrain raphe neurons to local temperature
A76-41202

NEUROPHYSIOLOGY

Physiology of emotion --- Russian book
A76-39207

Cytochemical investigations of proteins and RNA in spinal motoneurons and neurons of spinal ganglia of the rat after space flight
A76-39577

Interactive graphics in the analysis of neuronal spike train data
A76-40712

NEUTRON DIFFRACTION

Neutron diffraction studies of retinal rod outer segment membranes
A76-39009

NOISE INJURIES

Acute changes in animal inner ears due to simulated sonic booms
A76-38990

NOISE REDUCTION

Earplug rankings based on the Protector-Attenuation Rating (P-AR)
[AD-A024756/9]
N76-28821

NOISE TOLERANCE

Hearing protectors for workers in energy plants
A76-40345

NONLINEAR SYSTEMS

Nonlinear diffusion models and spatial interactions in biological systems
N76-28806

NOREPINEPHRINE

Tissue catecholamine levels of the golden hamster *Mesocricetus auratus* acclimated to 7, 22 and 34 C
A76-40947

NUCLEOSIDES

Formation of nucleoside 5'-polyphosphates from nucleotides and trimetaphosphate
A76-40136

NUCLEOTIDES

The prebiotic synthesis of deoxythymidine oligonucleotides. II - Comparison of condensing agents
A76-40134

Formation of nucleoside 5'-polyphosphates from nucleotides and trimetaphosphate
A76-40136

Aminoacyl transfer from an adenylate anhydride to polyribonucleotides
A76-40138

**OPERATIONS RESEARCH**

Continuation of advanced crew procedures development techniques
[NASA-CR-147843]
N76-29909

OPERATOR PERFORMANCE

Application of statistical modeling to the investigation of the activity of the operator in man-machine automatic control system complexes
A76-40460

OPHTHALMOLOGY

Evoked potentials and visual acuity
A76-39687

OPTICAL ACTIVITY

On the origin of molecular 'handedness' in living systems --- paleomagnetic effects in prebiotic enantiomer synthesis
A76-40130

Crystallization and solid-state reaction as a route to asymmetric synthesis from achiral starting materials
A76-40131

Two techniques for eliminating luminol interference material and flow system configurations for luminol and firefly luciferase systems
[NASA-CR-144768]
N76-28808

OPTICAL ILLUSION

The significance of frequency gradients in binocular grating perception
A76-39685

OPTICAL TRACKING

Induced subject-relative movement - Persistence of apparent movement of a stationary point after removal of inducing stimulus
A76-38443

OPTIMAL CONTROL

Toward a respirator control system
N76-28818

OPTOMETRY

SUBJECT INDEX

OPTOMETRY

Evoked potentials and visual acuity A76-39687

ORGANIC COMPOUNDS

Closed system Fischer-Tropsch synthesis over meteoritic iron, iron ore and nickel-iron alloy --- deuterium-carbon monoxide reaction catalysis A76-39397

ORTHOSTATIC TOLERANCE

Investigation of causes of orthostatic instability A76-40633

OXIDIZERS

Effects of oxidant and sulfate interaction on production of lung lesions [PB-251729/0] N76-29902

OXYGEN

Kinetics of oxygen release from single-cell algae A76-40641

Development of two new oxygen self-rescuers [PB-250809/1] N76-28823

OXYGEN BREATHING

Application of hyperbaric oxygen therapy in a case of prolonged cerebral hypoxia following rapid decompression A76-39585

OXYGEN SUPPLY EQUIPMENT

Chemically generated supplemental oxygen systems in DC-10 and L-1011 aircraft --- a performance prediction and evaluation [PB-252023/7] N76-29916

OXYGEN TENSION

Effect of pressure and composition of gaseous medium on PO₂ and pCO₂ gradients between mixed alveolar air and arterial blood A76-40636

P

PAIN SENSITIVITY

Learning in the case of aversion-related signal concepts under conditions of avoidance and nonavoidance of the aversive situation A76-39550

PALLADIUM

Baseline levels of platinum and palladium in human tissue [PB-251885/0] N76-29903

PARACHUTE DESCENT

Operational stress and higher psychic functions - Observations on flight crews and parachutists in various phases of a parachute jump mission A76-38704

PARKINSON DISEASE

Investigation of the characteristics of muscle control during stabilization and rhythmic activity A76-40631

PATHOLOGICAL EFFECTS

Acute changes in animal inner ears due to simulated sonic booms A76-38990

Psychical disturbances in cases of burns caused by electric current A76-40344

PATHOLOGY

Cardiac pathology associated with high sustained +G/z/. I - Subendocardial hemorrhage A76-39578

Cardiac pathology associated with high sustained +G/z/. II - Stress cardiomyopathy A76-39579

PATTERN RECOGNITION

Motion constancy dependent upon perceived distance and the spatial frequency of the stimulus pattern A76-38441

Visual detection of patterns periodic in two dimensions A76-39686

Spatial pooling properties deduced from the detectability of FM and quasi-AM gratings - A reanalysis --- visual pattern detection A76-39688

Digital archiving of biomedical recordings for off-line computer analysis A76-40713

PEPTIDES

Prebiotic peptide-formation in the solid state. II - Reaction of glycine with adenosine 5 prime-triphosphate and P₁, P₂-diadenosine-pyrophosphate A76-40132

Prebiotic peptide-formation in the solid state. III - Condensation reactions of glycine in solid state mixtures containing inorganic polyphosphates A76-40133

The synthesis of specifically deuterated amino acids and peptides for use in biophysical studies A76-28805

PERCEPTUAL TIME CONSTANT

Perceptual latencies to sinusoidal gratings A76-39684

PERFORMANCE PREDICTION

Combining evidence presented simultaneously to the eye and the ear - A comparison of some predictive models A76-38440

Anxiety and performance - A study concerning the prediction of predictability A76-39549

Chemically generated supplemental oxygen systems in DC-10 and L-1011 aircraft --- a performance prediction and evaluation [PB-252023/7] N76-29916

PERIPHERAL CIRCULATION

Nocturnal lowering of thresholds for sweating and vasodilation A76-40885

PERIPHERAL VISION

The constancy of the orientation of the visual field A76-38442

The influence of selective attention in peripheral and foveal vision A76-38444

PERSONALITY TESTS

Motivational problems in candidate pilots A76-38706

Anxiety and performance - A study concerning the prediction of predictability A76-39549

PHARMACOLOGY

Drug/receptor interactions: The example of the cardiac glycoside receptor of the erythrocyte membrane [NASA-TT-P-17151] N76-28814

PHOBIAS

Notes on flight-related psychosyndromes, in particular phobic syndromes A76-38707

PHONOCARDIOGRAPHY

Orthogonal electrocardiogram, apex cardiogram, and atrial sound in normotensive and hypertensive 50-year-old men A76-38930

PHOSPHATES

Prebiotic peptide-formation in the solid state. III - Condensation reactions of glycine in solid state mixtures containing inorganic polyphosphates A76-40133

Formation of nucleoside 5'-polyphosphates from nucleotides and trimetaphosphate A76-40136

PHOSPHORYLATION

Cyanogen induced phosphorylation of D-fructose --- prebiotic modeling A76-40129

PHOTOOXIDATION

Kinetics of oxygen release from single-cell algae A76-40641

PHOTOSYNTHESIS

Solar energy utilization in photosynthesis A76-38316

Quantum electronic approach to study the initial stage of photosynthesis A76-40638

Experimental investigation of the physical characteristics of the initial stage of photosynthesis A76-40639

A cooperative model for the first stage of photosynthesis A76-40640

Kinetics of oxygen release from single-cell algae A76-40641

PHYSICAL EXERCISE

Glucagon and plasma catecholamines during
beta-receptor blockade in exercising man
A76-38801

Respiratory and other responses in subjects
immersed in cold water
A76-38802

Effects of exercise-induced stress on platelet
aggregation
A76-40575

Nocturnal lowering of thresholds for sweating and
vasodilation
A76-40885

Plasma renin, angiotensin II, and plasma and
urinary aldosterone in running exercise
A76-40886

PHYSICAL WORK

Effects of time zone changes on performance and
physiology of airline personnel
A76-39586

PHYSIOLOGICAL EFFECTS

Renal handling of citrate during heat-induced
hypocitricemia
A76-40198

Metabolic adaptations in brown adipose tissue of
the hamster in extreme ambient temperatures
A76-40199

PHYSIOLOGICAL RESPONSES

Acute changes in animal inner ears due to
simulated sonic booms
A76-38990

Physiological, subjective, and performance
correlates of reported boredom and monotony
while performing a simulated radar control task
[AD-A025426/8]
N76-29911

PHYSIOLOGICAL TESTS

Making use of the laboratory in aerospace medicine
A76-38703

PHYSIOLOGY

Control and modeling of physiological processes
--- Russian book
A76-40627

Method of detecting and counting bacteria
[NASA-CASE-GSC-11917-2]
N76-29891

PIGMENTS

Neutron diffraction studies of retinal rod outer
segment membranes
A76-39009

PILOT PERFORMANCE

Changes in clinical cardiologic measurements
associated with high +G/z/ stress
A76-39580

Application of hyperbaric oxygen therapy in a case
of prolonged cerebral hypoxia following rapid
decompression
A76-39585

Psychotherapy and return to flying duties
A76-39587

A model for human pilot behavior during wake
vortex encounter upsets
[AD-A024534/0]
N76-28822

Visual attention of private pilots, the proportion
of time devoted to outside the cockpit
[AD-A025468/0]
N76-29912

The effect of delay in the presentation of visual
information on pilot performance
[AD-A021418]
N76-29913

PILOT SELECTION

Motivational problems in candidate pilots
A76-38706

PILOT TRAINING

Effects of ground trainer use on the psychological
and physiological states of students in private
pilot training
[AD-A024704/9]
N76-29906

PLANETARY ATMOSPHERES

Life and the outer planets. I - Performance of
terrestrial organisms in ammonia-rich systems
A76-40985

PLANETARY EVOLUTION

Life and the outer planets. II - Enzyme activity
in ammonia-water systems and other exotic media
at various temperatures
A76-40986

PLANTS (BOTANY)

Quantum electronic approach to study the initial
stage of photosynthesis
A76-40638

Experimental investigation of the physical
characteristics of the initial stage of
photosynthesis
A76-40639

A cooperative model for the first stage of
photosynthesis
A76-40640

PLATELETS

Effects of exercise-induced stress on platelet
aggregation
A76-40575

PLATINUM

Baseline levels of platinum and palladium in human
tissue
[PB-251885/0]
N76-29903

PLETHYSMOGRAPHY

Measuring the magnetic fields of the human heart,
brain, muscles, and lungs
A76-39710

A new method to determine frequency
characteristics of the respiratory system
A76-40891

POLLUTION MONITORING

Monitoring spacecraft atmosphere contaminants by
laser absorption spectroscopy
[NASA-CR-148481]
N76-28820

POLYMER CHEMISTRY

On the possible role of organic melanoidin
polymers as matrices for prebiotic activity
A76-40137

POLYVINYL CHLORIDE

Toxicity of components of plastic having contact
with blood
[PB-251742/3]
N76-29901

POWER PLANTS

Hearing protectors for workers in energy plants
A76-40345

PRESSURE SENSORS

Catheter tip force transducer for cardiovascular
research
[NASA-CASE-NPO-13643-1]
N76-29896

PROTECTIVE CLOTHING

Antarctic clothing
[AD-A021714]
N76-29918

PROTEINS

Compositional nonrandomness - A quantitatively
conserved evolutionary invariant --- of protein
amino acid sequences
A76-40128

PSYCHOLOGICAL EFFECTS

Notes on flight-related psychosyndromes, in
particular phobic syndromes
A76-38707

Anxiety and performance - A study concerning the
prediction of predictability
A76-39549

PSYCHOLOGICAL FACTORS

Motivational problems in candidate pilots
A76-38706

PSYCHOLOGICAL TESTS

Effect of information feedback upon intertrial
consistency of time judgment
A76-41322

Elimination by aspects as a decision rule for
risky choice
A76-41323

PSYCHOMOTOR PERFORMANCE

Response of the hydrodynamically interacting
senicircular canals to an adequate stimulus
A76-40628

PSYCHOTHERAPY

Psychotherapy and return to flying duties
A76-39587

PSYCHOTIC DEPRESSION

Psychical disturbances in cases of burns caused by
electric current
A76-40344

PULMONARY CIRCULATION

Role of diffusion in intrapulmonary mixing of gases
A76-40635

Effect of pressure and composition of gaseous
medium on PO₂ and pCO₂ gradients between mixed
alveolar air and arterial blood
A76-40636

Effect of angiotensin on hypoxic pulmonary
vasoconstriction in isolated dog lung
A76-40889

PULMONARY FUNCTIONS

PULMONARY FUNCTIONS

- Role of the alveolar ventilation/perfusion line in a periodically ventilated lung model A76-40637

PULMONARY LESIONS

- Effects of oxidant and sulfate interaction on production of lung lesions [PB-251729/0] N76-29902

PULSED RADIATION

- Thermal effect in the soft tissue for the case of focused ultrasonic fields of short duration time N76-29899

Q

QUANTUM THEORY

- Quantum electronic approach to study the initial stage of photosynthesis A76-40638
A cooperative model for the first stage of photosynthesis A76-40640

R

RADIATION DAMAGE

- Interactions of carcinogens with human cell DNA: Damage and Repair [CONF-750745-1] N76-29900

RADIATION DOSAGE

- Course on High Energy Radiation Dosimetry and Protection, 1st, International School of Radiation Damage and Protection, Erice, Italy, October 1-10, 1975, Proceedings A76-38343
Microdosimetry and the effects of small doses of radiation A76-38348

RADIATION EFFECTS

- The biological effects of high-energy radiation A76-38347

RADIATION HAZARDS

- Dosimetry during space missions A76-38346
Avoidance of radiation hazards from microwave antennas A76-41124
Recovery during radiation and chemical mutagenesis N76-28809

RADIATION INJURIES

- Microdosimetry and the effects of small doses of radiation A76-38348
The measurement of threshold temperatures in the ocular fundus for laser induced, visible lesions N76-28811

RADIATION PROTECTION

- Course on High Energy Radiation Dosimetry and Protection, 1st, International School of Radiation Damage and Protection, Erice, Italy, October 1-10, 1975, Proceedings A76-38343

RADIATION SICKNESS

- Electromagnetic compatibility /EMC/ as a determining factor in biological effects caused by electric and magnetic fields A76-40757

RADIOBIOLOGY

- The biological effects of high-energy radiation A76-38347
Microdosimetry and the effects of small doses of radiation A76-38348
Electromagnetic compatibility /EMC/ as a determining factor in biological effects caused by electric and magnetic fields A76-40757
Avoidance of radiation hazards from microwave antennas A76-41124
Recovery during radiation and chemical mutagenesis N76-28809

RADIOLOGY

- Simultaneous measurement of cardiac output and its distribution with microspheres in the rat A76-41143

REACTION KINETICS

- Kinetics of oxygen release from single-cell algae A76-40641

SUBJECT INDEX

REFLEXES

- Central neural mechanisms governing postural cardiovascular mechanisms [NASA-CR-148603] N76-29898

REMOTE CONTROL

- Canadian remote manipulator system for NASA Space Shuttle A76-39714

RENAL FUNCTION

- Renal handling of citrate during heat-induced hypocitricemia A76-40198
Plasma renin, angiotensin II, and plasma and urinary aldosterone in running exercise A76-40886

RESEARCH FACILITIES

- Definition of performance specifications for automated Analytical Electrophoresis Facility (AARF) [NASA-CR-149957] N76-29892

RESONANT FREQUENCIES

- A new method to determine frequency characteristics of the respiratory system A76-40891

RESPIRATORS

- Toward a respirator control system N76-28818

RESPIRATORY DISEASES

- Effects of oxidant and sulfate interaction on production of lung lesions [PB-251729/0] N76-29902

RESPIRATORY IMPEDANCE

- A new method to determine frequency characteristics of the respiratory system A76-40891
Diagnostic application of microwave radiation N76-28810

RESPIRATORY PHYSIOLOGY

- Behavior of some respiratory parameters in student pilots - A comparative study on two distinct groups examined ten years apart A76-38702
Effect of pressure and composition of gaseous medium on PO2 and pCO2 gradients between mixed alveolar air and arterial blood A76-40636
Role of the alveolar ventilation/perfusion line in a periodically ventilated lung model A76-40637

RESPIRATORY RATE

- Respiratory and other responses in subjects immersed in cold water A76-38802

RESPIRATORY SYSTEM

- Simulation of the respiratory control system A76-40195
Role of diffusion in intrapulmonary mixing of gases A76-40635
A new method to determine frequency characteristics of the respiratory system A76-40891

RETINA

- Neutron diffraction studies of retinal rod outer segment membranes A76-39009

RETINAL ADAPTATION

- The constancy of the orientation of the visual field A76-38442
Effect of pre-adapting spectral stimuli on visual responses --- aircrew reactions to cockpit display design A76-39582
The effects of adaptation to stereoscopic depth and to unocular image magnification on the duration of short-term visual storage A76-41324

RIBONUCLEIC ACIDS

- Cytochemical investigations of proteins and RNA in spinal motoneurons and neurons of spinal ganglia of the rat after space flight A76-39577
Aminoacyl transfer from an adenylate anhydride to polyribonucleotides A76-40138

RIDING QUALITY

- Integration of visual and motion cues for simulator requirements and ride quality investigation [NASA-CR-148479] N76-28819

- RISK**
Elimination by aspects as a decision rule for risky choice
A76-41323
- ROBOTS**
Tracking: An approach to dynamic vision and hand-eye coordination
[AD-A021674]
N76-29917
- ROLL**
A model for human pilot behavior during wake vortex encounter upsets
[AD-A024534/0]
N76-28822
- S**
- SACCADIC EYE MOVEMENTS**
Influence of socially used drugs on vision and vision performance
[AD-A022024]
N76-29905
- SAFETY MANAGEMENT**
Avoidance of radiation hazards from microwave antennas
A76-41124
- SCENE ANALYSIS**
Tracking: An approach to dynamic vision and hand-eye coordination
[AD-A021674]
N76-29917
- SELF STIMULATION**
Physiology of emotion --- Russian book
A76-39207
- SEMICIRCULAR CANALS**
Response of the hydrodynamically interacting semicircular canals to an adequate stimulus
A76-40628
Results of physical modeling of the system of semicircular canals in man - Functioning of the vestibular apparatus during oscillations of the head
A76-40629
- SENSORY PERCEPTION**
Combining evidence presented simultaneously to the eye and the ear - A comparison of some predictive models
A76-38440
Operational stress and higher psychic functions - Observations on flight crews and parachutists in various phases of a parachute jump mission
A76-38704
- SENSORY STIMULATION**
Learning in the case of aversion-related signal concepts under conditions of avoidance and nonavoidance of the aversive situation
A76-39550
- SHIVERING**
Threshold temperatures for shivering in acute and chronic hypercapnia
A76-40888
- SIGNAL PROCESSING**
Application of digital filtering and data compression to biomedical signal processing and telemetry
A76-39727
- SKIN TEMPERATURE (BIOLOGY)**
Threshold temperatures for shivering in acute and chronic hypercapnia
A76-40888
- SLEEP**
Physiology of emotion --- Russian book
A76-39207
Effects of abrupt time zone change on some circadian rhythms in man
[NASA-TT-P-17117]
N76-28813
- SODIUM COMPOUNDS**
Compartmentalization of amino acids in surfactant aggregates - Partitioning between water and aqueous micellar sodium dodecanoate and between hexane and dodecylammonium propionate trapped water in hexane
A76-40135
- SOLAR ENERGY CONVERSION**
Solar energy utilization in photosynthesis
A76-38316
- SOLID STATE**
Prebiotic peptide-formation in the solid state. II - Reaction of glycine with adenosine 5 prime-triphosphate and P1, P2-diadenosine-pyrophosphate
A76-40132
- Prebiotic peptide-formation in the solid state. III - Condensation reactions of glycine in solid state mixtures containing inorganic polyphosphates
A76-40133
- SOLID STATE DEVICES**
Evaluation of self-contained anthropomorphic dummy data acquisition system
[PB-250722/6]
N76-28824
- SONAR**
Bioacoustics --- Russian book
A76-40224
- SONIC BOOMS**
Acute changes in animal inner ears due to simulated sonic booms
A76-38990
- SOUND LOCALIZATION**
Bioacoustics --- Russian book
A76-40224
- SPACE ENVIRONMENT SIMULATION**
Space flight effects on skeletal bones of rats - Light and electron microscopic examination
A76-39581
- SPACE FLIGHT STRESS**
Space flight effects on the skeletal muscles of rats
A76-39576
Cytochemical investigations of proteins and RNA in spinal motoneurons and neurons of spinal ganglia of the rat after space flight
A76-39577
Space flight effects on skeletal bones of rats - Light and electron microscopic examination
A76-39581
Space flight effects on the hemopoietic function of bone marrow of the rat
A76-39583
- SPACE MISSIONS**
Dosimetry during space missions
A76-38346
- SPACE PERCEPTION**
Motion constancy dependent upon perceived distance and the spatial frequency of the stimulus pattern
A76-38441
The effects of adaptation to stereoscopic depth and to uniocular image magnification on the duration of short-term visual storage
A76-41324
- SPACE SHUTTLES**
Canadian remote manipulator system for NASA Space Shuttle
A76-39714
- SPACECRAFT CABIN ATMOSPHERES**
Monitoring spacecraft atmosphere contaminants by laser absorption spectroscopy
[NASA-CR-148481]
N76-28820
- SPACECRAFT DESIGN**
Canadian remote manipulator system for NASA Space Shuttle
A76-39714
- SPACECRAFT SHIELDING**
Dosimetry during space missions
A76-38346
- SPACECREWS**
Continuation of advanced crew procedures development techniques
[NASA-CR-147843]
N76-29909
- SPATIAL DISTRIBUTION**
Spatial pooling properties deduced from the detectability of FM and quasi-AM gratings - A reanalysis --- visual pattern detection
A76-39688
- SPIKE POTENTIALS**
Interactive graphics in the analysis of neuronal spike train data
A76-40712
- SPINAL CORD**
Cytochemical investigations of proteins and RNA in spinal motoneurons and neurons of spinal ganglia of the rat after space flight
A76-39577
Investigation of causes of orthostatic instability
A76-40633
- STANDARDS**
Criteria for a recommended standard. Occupational exposure to carbon tetrachloride
[PB-250424/9]
N76-28817

STATISTICAL ANALYSIS

SUBJECT INDEX

STATISTICAL ANALYSIS

Compositional nonrandomness - A quantitatively conserved evolutionary invariant --- of protein amino acid sequences

A76-40128

Application of statistical modeling to the investigation of the activity of the operator in man-machine automatic control system complexes

A76-40460

STATISTICAL DECISION THEORY

Elimination by aspects as a decision rule for risky choice

A76-41323

STEREOCHEMISTRY

On the origin of molecular 'handedness' in living systems --- paleomagnetic effects in prebiotic enantiomer synthesis

A76-40130

STEREOSCOPIC VISION

The effects of adaptation to stereoscopic depth and to unocular image magnification on the duration of short-term visual storage

A76-41324

STOCHASTIC PROCESSES

Compositional nonrandomness - A quantitatively conserved evolutionary invariant --- of protein amino acid sequences

A76-40128

STRESS (PHYSIOLOGY)

Effects of exercise-induced stress on platelet aggregation

A76-40575

Mental and perceptual performance in heat [PB-251439/6]

N76-29915

STRESS (PSYCHOLOGY)

Operational stress and higher psychic functions - Observations on flight crews and parachutists in various phases of a parachute jump mission

A76-38704

Notes on flight-related psychosyndromes, in particular phobic syndromes

A76-38707

Anxiety and performance - A study concerning the prediction of predictability

A76-39549

Effects of ground trainer use on the psychological and physiological states of students in private pilot training [AD-A024704/9]

N76-29906

SUBMERGING

Respiratory and other responses in subjects immersed in cold water

A76-38802

SULFATES

Effects of oxidant and sulfate interaction on production of lung lesions [PB-251729/0]

N76-29902

SURFACTANTS

Compartmentalization of amino acids in surfactant aggregates - Partitioning between water and aqueous micellar sodium dodecanoate and between hexane and dodecylammonium propionate trapped water in hexane

A76-40135

SWEAT

Nocturnal lowering of thresholds for sweating and vasodilation

A76-40885

SYMPATHETIC NERVOUS SYSTEM

Investigation of cerebrospinal reflexes - A review of the concept of bulbar vasomotor center

A76-40632

Implantable electrode for recording nerve signals in awake animals

A76-40892

SYSTOLIC PRESSURE

Systolic time intervals during +Gz acceleration

A76-40887

T

TAXONOMY

Natural history of agaricines --- taxonomy and morphology of fungi [NASA-TT-F-16514]

N76-28807

TEMPERATURE EFFECTS

Renal handling of citrate during heat-induced hypocitricemia

A76-40198

Metabolic adaptations in brown adipose tissue of the hamster in extreme ambient temperatures

A76-40199

Responses of midbrain raphe neurons to local temperature

A76-41202

Thermal effect in the soft tissue for the case of focused ultrasonic fields of short duration time

N76-29899

TEMPERATURE MEASUREMENT

The measurement of threshold temperatures in the ocular fundus for laser induced, visible lesions

N76-28811

Miniature ingestible telemeter devices to measure deep-body temperature [NASA-CASE-ARC-10583-1]

N76-29894

TERRAIN

Ground observer ability to detect and estimate the range of jet aircraft flying over hilly terrain [AD-A020657]

N76-29914

THALAMUS

Hypothalamic and thalamic blood flow during somatic afferent stimulation in dogs

A76-40200

THERMOREGULATION

Nocturnal lowering of thresholds for sweating and vasodilation

A76-40885

Threshold temperatures for shivering in acute and chronic hypercapnia

A76-40888

Tissue catecholamine levels of the golden hamster /Mesocricetus auratus/ acclimated to 7, 22 and 34 C

A76-40947

Effects of electrical stimulation in the lower brainstem on temperature regulation in the unanaesthetized guinea-pig

A76-41201

THICKNESS

Myocardium wall thickness transducer and measuring method [NASA-CASE-NPO-13644-1]

N76-29895

THRESHOLDS (PERCEPTION)

Structure and properties of a single channel in the human visual system

A76-39683

Perceptual latencies to sinusoidal gratings

A76-39684

Visual detection of patterns periodic in two dimensions

A76-39686

Threshold temperatures for shivering in acute and chronic hypercapnia

A76-40888

TIME DEPENDENCE

Effects of time zone changes on performance and physiology of airline personnel

A76-39586

TIME DISCRIMINATION

Effect of information feedback upon intertrial consistency of time judgment

A76-41322

TIME LAG

Jet lag isn't just a state of mind --- prolonged flight effects on circadian dysrhythmia

A76-40127

Systolic time intervals during +Gz acceleration

A76-40887

TIME SHARING

Application of statistical modeling to the investigation of the activity of the operator in man-machine automatic control system complexes

A76-40460

TISSUES (BIOLOGY)

Resonance ultrasonic measurements of microscopic gas bubbles --- in living tissue

A76-39588

Electromagnetic field effects in nerve tissue

A76-40752

Thermal effect in the soft tissue for the case of focused ultrasonic fields of short duration time

N76-29899

Baseline levels of platinum and palladium in human tissue [PB-251885/0]

N76-29903

TOXICITY

Biological evaluation of the toxicity of gases produced under fire conditions by synthetic materials. I - Methods and preliminary experiments concerning the reaction of animals to simple mixtures of air and carbondioxide or carbonmonoxide

A76-38619

Toxicity of components of plastic having contact with blood

N76-29901

TOXICOLOGY

Current awareness service for toxic substances

(CATS). Cumulative report no. 1, Part 1

N76-28815

Current awareness service for toxic substances

(CATS). Cumulative report no. 1, Part 2

N76-28816

TRAINING SIMULATORS

Effects of ground trainer use on the psychological and physiological states of students in private pilot training

[AD-A024704/9]

N76-29906

TRANSDUCERS

Myocardium wall thickness transducer and measuring method

[NASA-CASE-NPO-13644-1]

N76-29895

TURBULENT WAKES

A model for human pilot behavior during wake

vortex encounter upsets

[AD-A024534/0]

N76-28822

U

ULTRASONIC RADIATION

Thermal effect in the soft tissue for the case of focused ultrasonic fields of short duration time

N76-29899

ULTRASONIC TESTS

Resonance ultrasonic measurements of microscopic gas bubbles --- in living tissue

A76-39588

URINALYSIS

Plasma renin, angiotensin II, and plasma and urinary aldosterone in running exercise

A76-40886

V

VASCULAR SYSTEM

Plasma vasopressin and renin activity in women exposed to bed rest and +G/z/ acceleration

A76-38803

VASOCONSTRICTION

Investigation of causes of orthostatic instability

A76-40633

Effect of angiotensin on hypoxic pulmonary

vasoconstriction in isolated dog lung

A76-40889

VASODILATION

Nocturnal lowering of thresholds for sweating and vasodilation

A76-40885

VECTORCARDIOGRAPHY

On the detection of the magnetic heart vector - An application of the reciprocity theorem

A76-40111

VESTIBULAR TESTS

Response of the hydrodynamically interacting semicircular canals to an adequate stimulus

A76-40628

Results of physical modeling of the system of semicircular canals in man - Functioning of the vestibular apparatus during oscillations of the head

A76-40629

VISION

Structure and properties of a single channel in the human visual system

A76-39683

VISUAL ACUITY

Evoked potentials and visual acuity

A76-39687

Influence of socially used drugs on vision and vision performance

[AD-A022024]

N76-29905

VISUAL DISCRIMINATION

The influence of selective attention in peripheral and foveal vision

A76-38444

VISUAL PERCEPTION

The constancy of the orientation of the visual field

A76-38442

A multistable movement display - Evidence for two separate motion systems in human vision

A76-39548

Effect of pre-adapting spectral stimuli on visual responses --- aircrew reactions to cockpit display design

A76-39582

Structure and properties of a single channel in the human visual system

A76-39683

Perceptual latencies to sinusoidal gratings

A76-39684

The significance of frequency gradients in binocular grating perception

A76-39685

Visual detection of patterns periodic in two dimensions

A76-39686

Spatial pooling properties deduced from the detectability of FM and quasi-AM gratings - A reanalysis --- visual pattern detection

A76-39688

Motion information in iconic memory

A76-41321

The effects of adaptation to stereoscopic depth and to uniocular image magnification on the duration of short-term visual storage

A76-41324

Visual attention of private pilots, the proportion of time devoted to outside the cockpit

N76-29912

Tracking: An approach to dynamic vision and hand-eye coordination

N76-29917

VISUAL SIGNALS

Combining evidence presented simultaneously to the eye and the ear - A comparison of some predictive models

A76-38440

Integration of visual and motion cues for simulator requirements and ride quality investigation

N76-28819

The effect of delay in the presentation of visual information on pilot performance

N76-29913

VISUAL STIMULI

Induced subject-relative movement - Persistence of apparent movement of a stationary point after removal of inducing stimulus

A76-38443

The influence of selective attention in peripheral and foveal vision

A76-38444

Motion information in iconic memory

A76-41321

VOICE COMMUNICATION

Effect of information feedback upon intertrial consistency of time judgment

A76-41322

W

WALKING

Moments at joints during human walking and the problem of maintaining equilibrium

A76-40630

WATER TEMPERATURE

Respiratory and other responses in subjects immersed in cold water

A76-38802

WEATHER DATA RECORDERS

Investigation of pilot self-briefing techniques. Volume 1: Methodology, results, and recommendations

N76-29907

WEIGHTLESSNESS

Space flight effects on the skeletal muscles of rats

A76-39576

Investigation of the mechanical parameters of fine blood vessels

A76-40634

WORKLOADS (PSYCHOPHYSIOLOGY)

SUBJECT INDEX

WORKLOADS (PSYCHOPHYSIOLOGY)

Notes on flight-related psychosyndromes, in
particular phobic syndromes

A76-38707

X

X RAY ANALYSIS

X-ray 3-D coded aperture imaging - Displaying the
heart

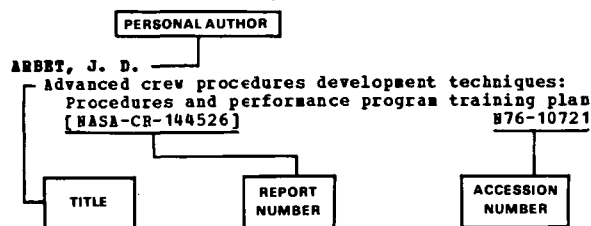
A76-39757

PERSONAL AUTHOR INDEX

AEROSPACE MEDICINE AND BIOLOGY / *A Continuing Bibliography (Suppl. 160)*

NOVEMBER 1976

Typical Personal Author Index Listing



The title of the document is used to provide the user with a brief description of the subject matter. The NASA or AIAA accession number is included in each entry to assist the user in locating the abstract in the abstract section of this supplement. If applicable, a report number is also included as an aid in identifying the document.

A

- ABE, H.
A study of handling quality assessment in manual control system
A76-39850
- ADAMS, A. J.
Influence of socially used drugs on vision and vision performance
[AD-A022024] N76-29905
- ALEXANDER, J. H.
Effect of angiotensin on hypoxic pulmonary vasoconstriction in isolated dog lung
A76-40889
- ANBLER, B. A.
The influence of selective attention in peripheral and foveal vision
A76-38444
- AMOSOV, N. M.
Modeling of intelligent behavior
[NASA-TT-F-17126] N76-29910
- ARBET, J. D.
Continuation of advanced crew procedures development techniques
[NASA-CR-147843] N76-29909
- ASANOV, A. N.
Kinetics of oxygen release from single-cell algae
A76-40641

B

- BACOW, J.
The constancy of the orientation of the visual field
A76-38442
- BAILEY, J. P.
Physiological, subjective, and performance correlates of reported boredom and monotony while performing a simulated radar control task
[AD-A025426/8] N76-29911
- BAILLY, J. V.
Dosimetry during space missions
A76-30346
- BAKALAR, K. H.
Digital archiving of biomedical recordings for off-line computer analysis
A76-40713
- BALDWIN, R. D.
Ground observer ability to detect and estimate the range of jet aircraft flying over hilly terrain
[AD-A020657] N76-29914

- BATEMAN, S. C.
Effects of time zone changes on performance and physiology of airline personnel
A76-39586
- BENBOW, R. L.
Continuation of advanced crew procedures development techniques
[NASA-CR-147843] N76-29909
- BENESI, A. J.
Enzymes in heterogeneous systems
N76-28804
- BERGLUND, G.
Orthogonal electrocardiogram, apex cardiogram, and atrial sound in normotensive and hypertensive 50-year-old men
A76-38930
- BILLIET, L.
A new method to determine frequency characteristics of the respiratory system
A76-40891
- BLUNDO, G.
Verification of hemostasis disorders in air force personnel
A76-38705
- BONNER, W. A.
On the origin of molecular 'handedness' in living systems
A76-40130
- BRADY, J. T.
The prebiotic synthesis of deoxythymidine oligonucleotides. II - Comparison of condensing agents
A76-40134
- BROOKS, D. E.
Definition of performance specifications for automated Analytical Electrophoresis Facility (AAEF)
[NASA-CR-149957] N76-29892
- BROWN, B.
Influence of socially used drugs on vision and vision performance
[AD-A022024] N76-29905
- BRUECK, K.
Effects of electrical stimulation in the lower brainstem on temperature regulation in the unanaesthetized guinea-pig
A76-41201
- BUCHNESS, R.
Interactive graphics in the analysis of neuronal spike train data
A76-40712
- BURTON, G. J.
Visual detection of patterns periodic in two dimensions
A76-39686
- BURTON, R. R.
Cardiac pathology associated with high sustained +G/z/. I - Subendocardial hemorrhage
A76-39578
- Cardiac pathology associated with high sustained +G/z/. II - Stress cardiomyopathy
A76-39579
- BUTCHER, W. I.
Cardiac pathology associated with high sustained +G/z/. II - Stress cardiomyopathy
A76-39579
- CAMANN, D. E.
Baseline levels of platinum and palladium in human tissue
[PB-251885/0] N76-29903

C

- CAPPELLINI, V.
Application of digital filtering and data
compression to biomedical signal processing and
telemetry A76-39727
- CASSUTO, Y.
Metabolic adaptations in brown adipose tissue of
the hamster in extreme ambient temperatures A76-40199
- CHABRE, M.
Neutron diffraction studies of retinal rod outer
segment membranes A76-39009
- CHAPPELLE, E. W.
Method of detecting and counting bacteria
[NASA-CASE-GSC-11917-2] N76-29891
- CHERNIGOVSKII, V. B.
Control and modeling of physiological processes A76-40627
- CHISUM, G. T.
Effect of pre-adapting spectral stimuli on visual
responses A76-39582
- CHRISTENSEN, H. J.
Glucagon and plasma catecholamines during
beta-receptor blockade in exercising man A76-38801
- CHUVAKOV, ZH. K.
Application of statistical modeling to the
investigation of the activity of the operator in
man-machine automatic control system complexes A76-40460
- COLQUHOUN, W. P.
Combining evidence presented simultaneously to the
eye and the ear - A comparison of some
predictive models A76-38440
- COOPER, P. R.
The effect of delay in the presentation of visual
information on pilot performance [AD-A021418] N76-29913
- COOPER, K. E.
Respiratory and other responses in subjects
immersed in cold water A76-38802
- CORCORAN, D. W. J.
Combining evidence presented simultaneously to the
eye and the ear - A comparison of some
predictive models A76-38440
- COBY, W. E.
Electromagnetic compatibility /EMC/ as a
determining factor in biological effects caused
by electric and magnetic fields A76-40757
- COSTELLO, L. C.
Renal handling of citrate during heat-induced
hypocitricemia A76-40198
- CRAIG, A.
Combining evidence presented simultaneously to the
eye and the ear - A comparison of some
predictive models A76-38440
- CRUMP, P. P.
Changes in clinical cardiologic measurements
associated with high +G/z/ stress A76-39580
- CULLER, V. B.
Myocardium wall thickness transducer and measuring
method [NASA-CASE-NPO-13644-1] N76-29895
- Catheter tip force transducer for cardiovascular
research [NASA-CASE-NPO-13643-1] N76-29896
- CURTIS, S. B.
The biological effects of high-energy radiation A76-38347
- D
- DANTINO, E.
Notes on flight-related psychosyndromes, in
particular phobic syndromes A76-38707

- DAVIS, J. C.
Application of hyperbaric oxygen therapy in a case
of prolonged cerebral hypoxia following rapid
decompression A76-39585
- DAY, R. H.
Induced subject-relative movement - Persistence of
apparent movement of a stationary point after
removal of inducing stimulus A76-38443
- DEEN, D. P.
Recovery during radiation and chemical mutagenesis N76-28809
- DEGANI, CH.
Cyanogen induced phosphorylation of D-fructose A76-40129
- DEL RE, E.
Application of digital filtering and data
compression to biomedical signal processing and
telemetry A76-39727
- DELTHIL, S.
Evoked potentials and visual acuity A76-39687
- DENCHENKO, I. T.
Hypothalamic and thalamic blood flow during
somatic afferent stimulation in dogs A76-40200
- DENEEDTS, M.
A new method to determine frequency
characteristics of the respiratory system A76-40891
- DENKIN, P.
Motion information in iconic memory A76-41321
- DERIABKIN, V. N.
Experimental investigation of the physical
characteristics of the initial stage of
photosynthesis A76-40639
- DICHGANS, J.
Motion constancy dependent upon perceived distance
and the spatial frequency of the stimulus pattern A76-38441
- DICKINSON, R. G.
Induced subject-relative movement - Persistence of
apparent movement of a stationary point after
removal of inducing stimulus A76-38443
- DIENER, H. C.
Motion constancy dependent upon perceived distance
and the spatial frequency of the stimulus pattern A76-38441
- E
- EHLERS, T.
Anxiety and performance - A study concerning the
prediction of predictability A76-39549
- ELLIS, S.
Plasma vasopressin and renin activity in women
exposed to bed rest and +G/z/ acceleration A76-38803
- ENSERINK, E.
Evaluation of self-contained anthropomorphic dummy
data acquisition system [PB-250722/6] N76-28824
- ERDMANN, E.
Drug/receptor interactions: The example of the
cardiac glycoside receptor of the erythrocyte
membrane [NASA-TT-P-17151] N76-28814
- ERICKSON, H. H.
Cardiovascular function during sustained +G/z/
stress A76-39584
- ESTRIN, T.
Interactive graphics in the analysis of neuronal
spike train data A76-40712
- EVANGELISTI, A.
Application of digital filtering and data
compression to biomedical signal processing and
telemetry A76-39727

EVANS, M. E.
Continuation of advanced crew procedures
development techniques
[NASA-CR-147843] N76-29909

F

FAYOD, M. V.
Natural history of agaricines
[NASA-TT-P-16514] N76-28807

FELDSTEIN, C.
Myocardium wall thickness transducer and measuring
method
[NASA-CASE-NPO-13644-1] N76-29895
Catheter tip force transducer for cardiovascular
research
[NASA-CASE-NPO-13643-1] N76-29896

FENCL, V.
Alkaline shift in lumbar and intracranial CSF in
man after 5 days at high altitude N76-40890

FENDLER, J. H.
Compartmentalization of amino acids in surfactant
aggregates - Partitioning between water and
aqueous micellar sodium dodecanoate and between
hexane and dodecylammonium propionate trapped
water in hexane N76-40135

FILIPCZYNSKI, L.
Thermal effect in the soft tissue for the case of
focused ultrasonic fields of short duration time
N76-29899

FINKLE, D. L.
The influence of selective attention in peripheral
and foveal vision N76-38444

FLOH, M. C.
Influence of socially used drugs on vision and
vision performance
[AD-A022024] N76-29905

FORSTER, K. I.
Induced subject-relative movement - Persistence of
apparent movement of a stationary point after
removal of inducing stimulus N76-38443

FORTI, G.
Solar energy utilization in photosynthesis N76-38316

FOX, S. W.
Amino acid precursors in lunar fines - Limits to
the contribution of jet exhaust N76-41120

FREDERICK, C. L.
Electromagnetic compatibility /EMC/ as a
determining factor in biological effects caused
by electric and magnetic fields N76-40757

FREDERICKSON, E. W.
Ground observer ability to detect and estimate the
range of jet aircraft flying over hilly terrain
[AD-A020657] N76-29914

FREEMAN, G.
Effects of oxidant and sulfate interaction on
production of lung lesions
[PB-251729/0] N76-29902

FRYER, T. B.
Miniature ingestible telemeter devices to measure
deep-body temperature
[NASA-CASE-ARC-10583-1] N76-29894

GABEL, R. A.
Alkaline shift in lumbar and intracranial CSF in
man after 5 days at high altitude N76-40890

GALBO, H.
Glucagon and plasma catecholamines during
beta-receptor blockade in exercising man N76-38801

GARVIN, P. J.
Toxicity of components of plastic having contact
with blood
[PB-251742/3] N76-29901

GELPI, E.
Closed system Fischer-Tropsch synthesis over
meteoritic iron, iron ore and nickel-iron alloy
N76-39397

GEYER, M.
Anxiety and performance - A study concerning the
prediction of predictability N76-39549

GIBERT, J. M.
Closed system Fischer-Tropsch synthesis over
meteoritic iron, iron ore and nickel-iron alloy
N76-39397

GISEN, H.
Anxiety and performance - A study concerning the
prediction of predictability N76-39549

GILLINGHAM, K. K.
Changes in clinical cardiologic measurements
associated with high +G/z/ stress N76-39580

GOLD, A. J.
Renal handling of citrate during heat-induced
hypocitricemia N76-40198

GOODMAN, E. M.
Effects of extremely low frequency electromagnetic
fields on Physarum polycephalum
[AD-A021457] N76-29893

GORBUNOVA, A. V.
Cytochemical investigations of proteins and RNA in
spinal motoneurons and neurons of spinal ganglia
of the rat after space flight N76-39577

GOROKHOVA, G. P.
Space flight effects on skeletal bones of rats -
Light and electron microscopic examination N76-39581

GRABOYS, T. B.
Systolic time intervals during +Gz acceleration
N76-40887

GRAN, M.
Spatial pooling properties deduced from the
detectability of FM and quasi-AM gratings - A
reanalysis N76-39688

GRALL, Y.
Evoked potentials and visual acuity N76-39687

GRAU, U.
Learning in the case of aversion-related signal
concepts under conditions of avoidance and
nonavoidance of the aversive situation N76-39550

GREEN, B. S.
Crystallization and solid-state reaction as a
route to asymmetric synthesis from achiral
starting materials N76-40131

GREENBAUM, B.
Effects of extremely low frequency electromagnetic
fields on Physarum polycephalum
[AD-A021457] N76-29893

H

HAPT, J. I.
Effects of exercise-induced stress on platelet
aggregation N76-40575

HALMANN, M.
Cyanogen induced phosphorylation of D-fructose
N76-40129

HANLIN, M. P.
Observations on autoregulation in skeletal muscle
- The effects of arterial hypoxia N76-41142

HARADA, K.
Amino acid precursors in lunar fines - Limits to
the contribution of jet exhaust N76-41120

HARADA, Y.
Responses of midbrain raphe neurons to local
temperature N76-41202

HARE, P. E.
Amino acid precursors in lunar fines - Limits to
the contribution of jet exhaust N76-41120

HARRIS, W. T.
The effect of delay in the presentation of visual
information on pilot performance
[AD-A021418] N76-29913

- HARRISON, W. K.
Digital archiving of biomedical recordings for
off-line computer analysis A76-40713
- HAUSKE, G.
Perceptual latencies to sinusoidal gratings A76-39684
- HERPOL, C.
Biological evaluation of the toxicity of gases
produced under fire conditions by synthetic
materials. I - Methods and preliminary
experiments concerning the reaction of animals
to simple mixtures of air and carbondioxide or
carbonmonoxide A76-38619
- HICKS, R. E.
Effect of information feedback upon intertrial
consistency of time judgment A76-41322
- HILSTED, J.
Glucagon and plasma catecholamines during
beta-receptor blockade in exercising man A76-38801
- HIRAO, O.
A study of handling quality assessment in manual
control system A76-39850
- HOLMQUIST, R.
Compositional nonrandomness - A quantitatively
conserved evolutionary invariant A76-40128
- HOLST, J. J.
Glucagon and plasma catecholamines during
beta-receptor blockade in exercising man A76-38801
- HORI, T.
Responses of midbrain raphe neurons to local
temperature A76-41202
- HORTON, J. W.
Resonance ultrasonic measurements of microscopic
gas bubbles A76-39588
- HOSENFELD, J. M.
Baseline levels of platinum and palladium in human
tissue [PB-251885/0] N76-29903
- IAGODOVSKII, V. S.
Space flight effects on skeletal bones of rats -
light and electron microscopic examination A76-39581
- ILICHEV, V. D.
Bioacoustics A76-40224
- ILINA-KAKUEVA, E. I.
Space flight effects on the skeletal muscles of rats A76-39576

J

- JANOLSKY, A.
Influence of socially used drugs on vision and
vision performance [AD-A022024] N76-29905
- JASBERG, K. A.
Effect of angiotensin on hypoxic pulmonary
vasoconstriction in isolated dog lung A76-40889
- JOHANSSON, C.
Mental and perceptual performance in heat
[PB-251439/6] N76-29915
- JOHNSON, D. E.
Baseline levels of platinum and palladium in human
tissue [PB-251885/0] N76-29903
- JOHNSON, W. A.
A model for human pilot behavior during wake
vortex encounter upsets [AD-A024534/0] N76-28822
- JONES, R. T.
Influence of socially used drugs on vision and
vision performance [AD-A022024] N76-29905

- JONES, S. B.
Tissue catecholamine levels of the golden hamster
/Mesocricetus auratus/ acclimated to 7, 22 and
34 C A76-40947
- JONES, V. C.
Tracking: An approach to dynamic vision and
hand-eye coordination [AD-A021674] N76-29917
- JOYCE, J. W.
Fluidic Sensors for life support systems
[AD-A022016] N76-29919
- JUHOS, L. T.
Effects of oxidant and sulfate interaction on
production of lung lesions [PB-251729/0] N76-29902

K

- KAMBERSKY, V.
Hearing protectors for workers in energy plants A76-40345
- KASATKIN, A. M.
Modeling of intelligent behavior
[NASA-TT-P-17126] N76-29910
- KASATKINA, L. M.
Modeling of intelligent behavior
[NASA-TT-P-17126] N76-29910
- KAWATSUJI, M.
Cyanogen induced phosphorylation of D-fructose A76-40129
- KEIL, L. C.
Plasma vasopressin and renin activity in women
exposed to bed rest and +G/z/ acceleration A76-38803
- KENYON, D. B.
On the possible role of organic melanoidin
polymers as matrices for prebiotic activity A76-40137
- KIREEV, V. B.
Experimental investigation of the physical
characteristics of the initial stage of
photosynthesis A76-40639
- KIREEVA, T. B.
A cooperative model for the first stage of
photosynthesis A76-40640
- KIREEVA, T. B.
Investigation of the characteristics of muscle
control during stabilization and rhythmic activity A76-40631
- KLOTZ, E.
X-ray 3-D coded aperture imaging - Displaying the
heart A76-39757
- KOSUNEN, K. J.
Plasma renin, angiotensin II, and plasma and
urinary aldosterone in running exercise A76-40886
- KOVACH, A. G. B.
Hypothalamic and thalamic blood flow during
somatic afferent stimulation in dogs A76-40200
- KRIVENKOVA, N. P.
Space flight effects on the skeletal muscles of rats A76-39576
- KUBALA, A. L.
Ground observer ability to detect and estimate the
range of jet aircraft flying over hilly terrain
[AD-A020657] N76-29914

L

- LACEY, J. C., JR.
Aminoacyl transfer from an adenylate anhydride to
polyribonucleotides A76-40138
- LAHAV, M.
Crystallization and solid-state reaction as a
route to asymmetric synthesis from achiral
starting materials A76-40131
- LANDSER, F. J.
A new method to determine frequency
characteristics of the respiratory system A76-40891
- LATASH, L. P.
Physiology of emotion A76-39207

- LEGARGASSON, J. P.
Evoked potentials and visual acuity
A76-39687
- LEVITES, R.
Effects of exercise-induced stress on platelet aggregation
A76-40575
- LEWIS, G. W.
Myocardium wall thickness transducer and measuring method
[NASA-CASE-NPO-13644-1] N76-29895
Catheter tip force transducer for cardiovascular research
[NASA-CASE-NPO-13643-1] N76-29896
- LOHRMANN, R.
Prebiotic peptide-formation in the solid state. II - Reaction of glycine with adenosine 5 prime-triphosphate and P₁, P₂-diadenosine-pyrophosphate
A76-40132
Formation of nucleoside 5'-polyphosphates from nucleotides and trimetaphosphate
A76-40136
- LONGO, L.
Operational stress and higher psychic functions - Observations on flight crews and parachutists in various phases of a parachute jump mission
A76-38704
- LUKOSHKOVA, E. V.
Investigation of cerebrospinal reflexes - A review of the concept of bulbar vasomotor center
A76-40632
- LUPP, U.
Perceptual latencies to sinusoidal gratings
A76-39684

M

- MACKENZIE, W. P.
Cardiac pathology associated with high sustained +G/z/. I - Subendocardial hemorrhage
A76-39578
Cardiac pathology associated with high sustained +G/z/. II - Stress cardiomyopathy
A76-39579
- MAHMIVUO, J.
On the detection of the magnetic heart vector - An application of the reciprocity theorem
A76-40111
- MANGIARACINA, A. A.
Continuation of advanced crew procedures development techniques
[NASA-CR-147843] N76-29909
- MARROW, R. T.
Effects of extremely low frequency electromagnetic fields on Physarum polycephalum
[AD-A021457] N76-29893
- MARTIN, S.
Respiratory and other responses in subjects immersed in cold water
A76-38802
- MASSOUDI, H.
Long-wavelength analysis of electromagnetic power absorption by prolate spheroidal and ellipsoidal models of man
N76-28812
- MCCLUSKEY, M. R.
Ground observer ability to detect and estimate the range of jet aircraft flying over hilly terrain
[AD-A020657] N76-29914
- MCDEVITT, D. G.
Simultaneous measurement of cardiac output and its distribution with microspheres in the rat
A76-41143
- MCGAVERN, J. L.
Continuation of advanced crew procedures development techniques
[NASA-CR-147843] N76-29909
- MEICHEN, P. W.
Effects of time zone changes on performance and physiology of airline personnel
A76-39586
- MEINERT, G.
Behavior of some respiratory parameters in student pilots - A comparative study on two distinct groups examined ten years apart
A76-38702

- MELTON, C. E., JR.
Effects of ground trainer use on the psychological and physiological states of students in private pilot training
[AD-A024704/9] N76-29906
- MICHAELS, C. P.
Motion information in iconic memory
A76-41321
- MICHAELSON, E. D.
Systolic time intervals during +Gz acceleration
A76-40887
- MILHORN, H. T., JR.
Simulation of the respiratory control system
A76-40195
- MILLIGAN, H. D.
Investigation of pilot self-briefing techniques. Volume 1: Methodology, results, and recommendations
[AD-A024645/4] N76-29907
- MINNE, R.
Biological evaluation of the toxicity of gases produced under fire conditions by synthetic materials. I - Methods and preliminary experiments concerning the reaction of animals to simple mixtures of air and carbondioxide or carbonmonoxide
A76-38619
- MIRIPOL, J. E.
Toxicity of components of plastic having contact with blood
[PB-251742/3] N76-29901
- MOISE, R.
Compositional nonrandomness - A quantitatively conserved evolutionary invariant
A76-40128
- MOISEEV, V. A.
Investigation of causes of orthostatic instability
A76-40633
- MOISEYEVA, N. I.
Effects of abrupt time zone change on some circadian rhythms in man
[NASA-TT-F-17117] N76-28813
- MOSKALENKO, Y. E.
Hypothalamic and thalamic blood flow during somatic afferent stimulation in dogs
A76-40200
- MOSTAPAVI, H.
Structure and properties of a single channel in the human visual system
A76-39683
- MUSACCHIA, X. J.
Tissue catecholamine levels of the golden hamster /Mesocricetus auratus/ acclimated to 7, 22 and 34 C
A76-40947
- MYERS, T. T.
A model for human pilot behavior during wake vortex encounter upsets
[AD-A024534/0] N76-28822

N

- NADEL, E. R.
Nocturnal lowering of thresholds for sweating and vasodilation
A76-40885
- NAGELS, J.
A new method to determine frequency characteristics of the respiratory system
A76-40891
- NAGYVARY, J.
Compartmentalization of amino acids in surfactant aggregates - Partitioning between water and aqueous micellar sodium dodecanoate and between hexane and dodecylammonium propionate trapped water in hexane
A76-40135
- NEWELL, J. B.
Observations on autoregulation in skeletal muscle - The effects of arterial hypoxia
A76-41142
- NIES, A. S.
Simultaneous measurement of cardiac output and its distribution with microspheres in the rat
A76-41143

- NIKOLAEV, V. P.
Effect of pressure and composition of gaseous medium on PO₂ and pCO₂ gradients between mixed alveolar air and arterial blood
A76-40636
- NINOHAYA, I.
Implantable electrode for recording nerve signals in awake animals
A76-40892
- NISSENBAUM, A.
On the possible role of organic melanoidin polymers as matrices for prebiotic activity
A76-40137
- NONE, P.
Compartmentalization of amino acids in surfactant aggregates - Partitioning between water and aqueous micellar sodium dodecanoate and between hexane and dodecylammonium propionate trapped water in hexane
A76-40135
- NOONER, D. W.
Closed system Fischer-Tropsch synthesis over meteoritic iron, iron ore and nickel-iron alloy
A76-39397
- NOYES, H. P.
On the origin of molecular 'handedness' in living systems
A76-40130
- NYBY, M. D.
Effect of angiotensin on hypoxic pulmonary vasoconstriction in isolated dog lung
A76-40889
- ODEHMAL, M.
Measuring the magnetic fields of the human heart, brain, muscles, and lungs
A76-39710
- ODOM, D. G.
The prebiotic synthesis of deoxythymidine oligonucleotides. II - Comparison of condensing agents
A76-40134
- OHLIN, D.
Personal hearing protective devices, fitting, care, and use
[AD-A021408]
N76-28825
- ORGEL, L. E.
Prebiotic peptide-formation in the solid state. II - Reaction of glycine with adenosine 5 prime-triphosphate and P_i, P₂-diadenosine-pyrophosphate
A76-40132
- Prebiotic peptide-formation in the solid state. III - Condensation reactions of glycine in solid state mixtures containing inorganic polyphosphates
A76-40133
- ORO, J.
Closed system Fischer-Tropsch synthesis over meteoritic iron, iron ore and nickel-iron alloy
A76-39397
- On the possible role of organic melanoidin polymers as matrices for prebiotic activity
A76-40137

P

- PAKARINEN, A. J.
Plasma renin, angiotensin II, and plasma and urinary aldosterone in running exercise
A76-40886
- PANTLE, A.
A multistable movement display - Evidence for two separate motion systems in human vision
A76-39548
- PAOLUCCI, G.
Making use of the laboratory in aerospace medicine
A76-38703
- Verification of hemostasis disorders in air force personnel
A76-38705
- PASTORELLI, M.
Application of digital filtering and data compression to biomedical signal processing and telemetry
A76-39727

- PAVLOVSKY, P.
Psychical disturbances in cases of burns caused by electric current
A76-40344
- PEDERSEN, P. C.
Diagnostic application of microwave radiation
N76-28810
- PERRY, C. J. G.
Psychotherapy and return to flying duties
A76-39587
- PETRICHEK, V.
Measuring the magnetic fields of the human heart, brain, muscles, and lungs
A76-39710
- PETUKHOV, S. V.
Results of physical modeling of the system of semicircular canals in man - Functioning of the vestibular apparatus during oscillations of the head
A76-40629
- PICCIANO, L.
A multistable movement display - Evidence for two separate motion systems in human vision
A76-39548
- PICCILOLO, G. L.
Method of detecting and counting bacteria
[NASA-CASE-GSC-11917-2]
N76-29891
- POHOST, G. M.
Observations on autoregulation in skeletal muscle - The effects of arterial hypoxia
A76-41142
- POPE, J. M.
Miniature ingestible telemeter devices to measure deep-body temperature
[NASA-CASE-ARC-10583-1]
N76-29894
- PORTUGALOV, V. V.
Space flight effects on the skeletal muscles of rats
A76-39576
- Cytochemical investigations of proteins and RNA in spinal motoneurons and neurons of spinal ganglia of the rat after space flight
A76-39577
- Space flight effects on the hemopoietic function of bone marrow of the rat
A76-39583
- POWELL, W. J., JR.
Observations on autoregulation in skeletal muscle - The effects of arterial hypoxia
A76-41142
- PRESTON, F. S.
Effects of time zone changes on performance and physiology of airline personnel
A76-39586
- PREVOST, R. J.
Baseline levels of platinum and palladium in human tissue
[PB-251885/0]
N76-29903
- PRIEBE, L. A.
The measurement of threshold temperatures in the ocular fundus for laser induced, visible lesions
N76-28811
- PROTASOV, V. R.
Bioacoustics
A76-40224

R

- RABI, T.
Metabolic adaptations in brown adipose tissue of the hamster in extreme ambient temperatures
A76-40199
- RAMACCI, C. A.
Behavior of some respiratory parameters in student pilots - A comparative study on two distinct groups examined ten years apart
A76-38702
- RANA, B.
An evaluation of the effectiveness of the FAA management training school
[AD-A025254/4]
N76-29908
- RANTYARD, R. H.
Elimination by aspects as a decision rule for risky choice
A76-41323
- REGAN, J. D.
Interactions of carcinogens with human cell DNA: Damage and Repair
[CONF-750745-1]
N76-29900

- REID, I.
Canadian remote manipulator system for NASA Space Shuttle
A76-39714
- REINIS, S.
Acute changes in animal inner ears due to simulated sonic booms
A76-38990
- REIS, D. J.
Central neural mechanisms governing postural cardiovascular mechanisms
[NASA-CR-148603]
N76-29898
- RIBEN, P.
Respiratory and other responses in subjects immersed in cold water
A76-38802
- RIGAUDIERE, F.
Evoked potentials and visual acuity
A76-39687
- ROBERTS, H. P.
Nocturnal lowering of thresholds for sweating and vasodilation
A76-40885
- ROGOWITZ, B. E.
Spatial pooling properties deduced from the detectability of PM and quasi-AM gratings - A reanalysis
A76-39688
- ROGOZA, A. M.
Investigation of the mechanical parameters of fine blood vessels
A76-40634
- ROMASHENKO, E. V.
Bioacoustics
A76-40224
- ROSENBERG, B. L.
Investigation of pilot self-briefing techniques. Volume 1: Methodology, results, and recommendations
[AD-A024645/4]
N76-29907
- ROSSI, H. E.
Microdosimetry and the effects of small doses of radiation
A76-38348
- ROTA, P.
Verification of hemostasis disorders in air force personnel
A76-38705
- ROTONDO, G.
A study on examination procedures for preventing traumatic and nontraumatic osteoarthropathies related to flying activities
A76-38701
- ROWAN, R.
Jet lag isn't just a state of mind
A76-40127
- S**
- SAIBIL, H.
Neutron diffraction studies of retinal rod outer segment membranes
A76-39009
- SAKRISON, D. J.
Structure and properties of a single channel in the human visual system
A76-39683
- SANDLER, H.
Cardiovascular function during sustained +G/z/ stress
A76-39584
- SANDLER, S. S.
Electromagnetic field effects in nerve tissue
A76-40752
- SANDOR, P.
Hypothalamic and thalamic blood flow during somatic afferent stimulation in dogs
A76-40200
- SARKISOV, I. IU.
Response of the hydrodynamically interacting semicircular canals to an adequate stimulus
A76-40628
- SAWAI, H.
Prebiotic peptide-formation in the solid state. II - Reaction of glycine with adenosine 5 prime-triphosphate and P1, P2-diadenosine-pyrophosphate
A76-40132
- Prebiotic peptide-formation in the solid state. III - Condensation reactions of glycine in solid state mixtures containing inorganic polyphosphates
A76-40133
- SCHAEFER, K. E.
Threshold temperatures for shivering in acute and chronic hypercapnia
A76-40888
- SCHILL, J. P.
Toward a respirator control system
N76-28818
- SCLABASSI, R. J.
Interactive graphics in the analysis of neuronal spike train data
A76-40712
- SERGEVA, K. A.
Investigation of causes of orthostatic instability
A76-40633
- SHABELNIKOV, V. G.
Effect of pressure and composition of gaseous medium on PO2 and pCO2 gradients between mixed alveolar air and arterial blood
A76-40636
- Role of the alveolar ventilation/perfusion line in a periodically ventilated lung model
A76-40637
- SHARKEY, V. J.
The effect of delay in the presentation of visual information on pilot performance
[AD-A021418]
N76-29913
- SHEFFIELD, P. J.
Application of hyperbaric oxygen therapy in a case of prolonged cerebral hypoxia following rapid decompression
A76-39585
- SHIK, L. L.
Investigation of causes of orthostatic instability
A76-40633
- Role of diffusion in intrapulmonary mixing of gases
A76-40635
- SHINN, D. H.
Avoidance of radiation hazards from microwave antennas
A76-41124
- SHORT, R. V.
Effects of time zone changes on performance and physiology of airline personnel
A76-39586
- SHILKIND, T. I.
Moments at joints during human walking and the problem of maintaining equilibrium
A76-40630
- SHVETS, V. M.
Space flight effects on the hemopoietic function of bone marrow of the rat
A76-39583
- SHYMKO, R. M.
Nonlinear diffusion models and spatial interactions in biological systems
N76-28806
- SIDORENKO, L. A.
Role of diffusion in intrapulmonary mixing of gases
A76-40635
- SIEGEL, S. M.
Life and the outer planets. I - Performance of terrestrial organisms in ammonia-rich systems
A76-40985
- Life and the outer planets. II - Enzyme activity in ammonia-water systems and other exotic media at various temperatures
A76-40986
- SILVER, R. H.
Myocardium wall thickness transducer and measuring method
[NASA-CASE-WFO-13644-1]
N76-29895
- Catheter tip force transducer for cardiovascular research
[NASA-CASE-WFO-13643-1]
N76-29896
- SIMKIN, G. M.
Bioacoustics
A76-40224
- SKELTON, G. E.
Visual attention of private pilots, the proportion of time devoted to outside the cockpit
[AD-A025468/0]
N76-29912
- SHITS, D. E.
Research on construction of a statistical model for predicting impact acceleration injury
[AD-A021669]
N76-29904

- SMITH, G. S.
Electromagnetic field effects in nerve tissue
A76-40752
- SMITH, R. C.
Effects of ground trainer use on the psychological and physiological states of students in private pilot training
[AD-A024704/9] N76-29906
An evaluation of the effectiveness of the FAA management training school
[AD-A025254/4] N76-29908
- SOTO, E. G.
Antarctic clothing
[AD-A021714] N76-29918
- SOURDILLE, J.
Evoked potentials and visual acuity
A76-39687
- SPANGLER, M. C.
Continuation of advanced crew procedures development techniques
[NASA-CR-147843] N76-29909
- SPARVIERI, P.
Motivational problems in candidate pilots
A76-38706
- SPEITEL, T.
Life and the outer planets. II - Enzyme activity in ammonia-water systems and other exotic media at various temperatures
A76-40986
- STEIN, R. L.
Development of two new oxygen self-rescuers
[PB-250809/1] N76-28823
- STEINBACHER, C. B.
Psychotherapy and return to flying duties
A76-39587
- STEINFELD, J. I.
Monitoring spacecraft atmosphere contaminants by laser absorption spectroscopy
[NASA-CR-148481] N76-28820
- STEPANSKII, G. A.
Physiology of emotion
A76-39207
- STERN, I. J.
Toxicity of components of plastic having contact with blood
[PB-251742/3] N76-29901
- STOLWIJK, J. A. J.
Nocturnal lowering of thresholds for sweating and vasodilation
A76-40885
- STONE, H. L.
Cardiovascular function during sustained +G/z/ stress
A76-39584
- SULZER, R. L.
Visual attention of private pilots, the proportion of time devoted to outside the cockpit
[AD-A025468/0] N76-29912
- SZELENYI, Z.
Effects of electrical stimulation in the lower brainstem on temperature regulation in the unanaesthetized guinea-pig
A76-41201
- T
TATUN, I. C.
Continuation of advanced crew procedures development techniques
[NASA-CR-147843] N76-29909
- TAYLOR, D. K.
An evaluation of the effectiveness of the FAA management training school
[AD-A025254/4] N76-29908
- THACKRAY, R. I.
Physiological, subjective, and performance correlates of reported boredom and monotony while performing a simulated radar control task
[AD-A025426/8] N76-29911
- THANASSI, J. W.
Reactions of aminomalonoitrile with electrophiles
A76-40139
- THOMAS, R. R.
Two techniques for eliminating luminol interference material and flow system configurations for luminol and firefly luciferase systems
[NASA-CR-144768] N76-28808
- TILLERY, J. B.
Baseline levels of platinum and palladium in human tissue
[PB-251885/0] N76-29903
- TOBIAS, J. V.
Earplug rankings based on the Protector-Attenuation Rating (P-AR)
[AD-A024756/9] N76-28821
- TOUCHSTONE, R. M.
Physiological, subjective, and performance correlates of reported boredom and monotony while performing a simulated radar control task
[AD-A025426/8] N76-29911
- TRIPTANIDI, L. A.
Space flight effects on skeletal bones of rats - Light and electron microscopic examination
A76-39581
- TRUKHAN, E. M.
Quantum electronic approach to study the initial stage of photosynthesis
A76-40638
Experimental investigation of the physical characteristics of the initial stage of photosynthesis
A76-40639
A cooperative model for the first stage of photosynthesis
A76-40640
- U
UPSON, D. A.
The synthesis of specifically deuterated amino acids and peptides for use in biophysical studies
N76-28805
- V
VAN DE WOESTIJNE, K. P.
A new method to determine frequency characteristics of the respiratory system
A76-40891
- VAN DER MEER, H. C.
The effects of adaptation to stereoscopic depth and to unocular image magnification on the duration of short-term visual storage
A76-41324
- VAN OUYTVE, E.
Biological evaluation of the toxicity of gases produced under fire conditions by synthetic materials. I - Methods and preliminary experiments concerning the reaction of animals to simple mixtures of air and carbon dioxide or carbon monoxide
A76-38619
- VASILEV, B. D.
Bioacoustics
A76-40224
- W
WALLACH, H.
The constancy of the orientation of the visual field
A76-38442
- WALLENTIN, I.
Orthogonal electrocardiogram, apex cardiogram, and atrial sound in normotensive and hypertensive 50-year-old men
A76-38930
- WALLIN, R. F.
Toxicity of components of plastic having contact with blood
[PB-251742/3] N76-29901
- WEBER, A. L.
Aminoacyl transfer from an adenylate anhydride to polynucleotides
A76-40138
- WEISKOPF, R. B.
Alkaline shift in lumbar and intracranial CSF in man after 5 days at high altitude
A76-40890
- WEISS, H.
X-ray 3-D coded aperture imaging - Displaying the heart
A76-39757
- WELLS, C. H.
Resonance ultrasonic measurements of microscopic gas bubbles
A76-39588

- WENGER, C. B.
Nocturnal lowering of thresholds for sweating and
vasodilation
A76-40885
- WIKSTRAND, J.
Orthogonal electrocardiogram, apex cardiogram, and
atrial sound in normotensive and hypertensive
50-year-old men
A76-38930
- WILHELMSEN, L.
Orthogonal electrocardiogram, apex cardiogram, and
atrial sound in normotensive and hypertensive
50-year-old men
A76-38930
- WILKINSON, R.
Effects of time zone changes on performance and
physiology of airline personnel
A76-39586
- WILSON, H. R.
The significance of frequency gradients in
binocular grating perception
A76-39685
- WILSON, M. P.
Implantable electrode for recording nerve signals
in awake animals
A76-40892
- WIST, E. R.
Motion constancy dependent upon perceived distance
and the spatial frequency of the stimulus pattern
A76-38441
- WOLF, W.
Perceptual latencies to sinusoidal gratings
A76-39684
- WOODS, R. L.
Fluidic Sensors for life support systems
[AD-A022016]
N76-29919
- WORCESTER, D.
Neutron diffraction studies of retinal rod outer
segment membranes
A76-39009
- WRIGHT, A. D.
Ground observer ability to detect and estimate the
range of jet aircraft flying over hilly terrain
[AD-A020657]
N76-29914
- WUENNEBERG, W.
Threshold temperatures for shivering in acute and
chronic hypercapnia
A76-40888

Y

- YONEZAWA, Y.
Implantable electrode for recording nerve signals
in awake animals
A76-40892
- YOUNG, L. R.
Integration of visual and motion cues for
simulator requirements and ride quality
investigation
[NASA-CR-148479]
N76-28819

Z

- ZEISBERGER, E.
Effects of electrical stimulation in the lower
brainstem on temperature regulation in the
unanaesthetized guinea-pig
A76-41201
- ZHANTIEV, R. D.
Bioacoustics
A76-40224

1. Report No. NASA SP-7011(160)		2. Government Accession No.		3. Recipient's Catalog No.	
4. Title and Subtitle AEROSPACE MEDICINE AND BIOLOGY A Continuing Bibliography (Supplement 160)				5. Report Date November 1976	
				6. Performing Organization Code	
7. Author(s)				8. Performing Organization Report No.	
9. Performing Organization Name and Address National Aeronautics and Space Administration Washington, D. C. 20546				10. Work Unit No.	
				11. Contract or Grant No.	
12. Sponsoring Agency Name and Address				13. Type of Report and Period Covered	
				14. Sponsoring Agency Code	
15. Supplementary Notes					
16. Abstract This bibliography lists 166 reports, articles, and other documents introduced into the NASA scientific and technical information system in October 1976.					
17. Key Words (Suggested by Author(s)) Aerospace Medicine Bibliographies Biological Effects				18. Distribution Statement Unclassified - Unlimited	
19. Security Classif. (of this report) Unclassified		20. Security Classif. (of this page) Unclassified		22. Price \$4.00 HC	
				21. No. of Pages 62	

PUBLIC COLLECTIONS OF NASA DOCUMENTS

DOMESTIC

NASA distributes its technical documents and bibliographic tools to ten special libraries located in the organizations listed below. Each library is prepared to furnish the public such services as reference assistance, interlibrary loans, photocopy service, and assistance in obtaining copies of NASA documents for retention.

CALIFORNIA

University of California, Berkeley

COLORADO

University of Colorado, Boulder

DISTRICT OF COLUMBIA

Library of Congress

GEORGIA

Georgia Institute of Technology, Atlanta

ILLINOIS

The John Crerar Library, Chicago

MASSACHUSETTS

Massachusetts Institute of Technology, Cambridge

MISSOURI

Linda Hall Library, Kansas City

NEW YORK

Columbia University, New York

PENNSYLVANIA

Carnegie Library of Pittsburgh

WASHINGTON

University of Washington, Seattle

NASA publications (those indicated by an "*" following the accession number) are also received by the following public and free libraries:

CALIFORNIA

Los Angeles Public Library

San Diego Public Library

COLORADO

Denver Public Library

CONNECTICUT

Hartford Public Library

MARYLAND

Enoch Pratt Free Library, Baltimore

MASSACHUSETTS

Boston Public Library

MICHIGAN

Detroit Public Library

MINNESOTA

Minneapolis Public Library

MISSOURI

Kansas City Public Library

St. Louis Public Library

NEW JERSEY

Trenton Public Library

NEW YORK

Brooklyn Public Library

Buffalo and Erie County Public Library

Rochester Public Library

New York Public Library

OHIO

Akron Public Library

Cincinnati Public Library

Cleveland Public Library

Dayton Public Library

Toledo Public Library

OKLAHOMA

Oklahoma County Libraries, Oklahoma City

TENNESSEE

Memphis Public Library

TEXAS

Dallas Public Library

Fort Worth Public Library

WASHINGTON

Seattle Public Library

WISCONSIN

Milwaukee Public Library

An extensive collection of NASA and NASA-sponsored documents and aerospace publications available to the public for reference purposes is maintained by the American Institute of Aeronautics and Astronautics, Technical Information Service, 750 Third Avenue, New York, New York, 10017.

EUROPEAN

An extensive collection of NASA and NASA-sponsored publications is maintained by the British Library Lending Division, Boston Spa, Wetherby, Yorkshire, England. By virtue of arrangements other than with NASA, the British Library Lending Division also has available many of the non-NASA publications cited in *STAR*. European requesters may purchase facsimile copy or microfiche of NASA and NASA-sponsored documents, those identified by both the symbols "#" and "*", from: ESRO/ELDO Space Documentation Service, European Space Research Organization, 114, av. Charles de Gaulle, 92-Neuilly-sur-Seine, France.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
WASHINGTON, D.C. 20546

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE \$300

SPECIAL FOURTH CLASS MAIL
Book

POSTAGE AND FEES PAID
NATIONAL AERONAUTICS AND
SPACE ADMINISTRATION
NASA-451



POSTMASTER: If Undeliverable (Section 158
Postal Manual) Do Not Return

NASA CONTINUING BIBLIOGRAPHY SERIES

NUMBER	TITLE	FREQUENCY
NASA SP-7011	AEROSPACE MEDICINE AND BIOLOGY Aviation medicine, space medicine, and space biology	Monthly
NASA SP-7037	AERONAUTICAL ENGINEERING Engineering, design, and operation of aircraft and aircraft components	Monthly
NASA SP-7039	NASA PATENT ABSTRACTS BIBLIOGRAPHY NASA patents and applications for patent	Semiannually
NASA SP-7041	EARTH RESOURCES Remote sensing of earth resources by aircraft and spacecraft	Quarterly
NASA SP-7043	ENERGY Energy sources, solar energy, energy conversion, transport, and storage	Quarterly
NASA SP-7500	MANAGEMENT Program, contract, and personnel management, and management techniques	Annually

Details on the availability of these publications may be obtained from:

SCIENTIFIC AND TECHNICAL INFORMATION OFFICE

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Washington, D.C. 20546